マルチメディア戦略に賭る提携

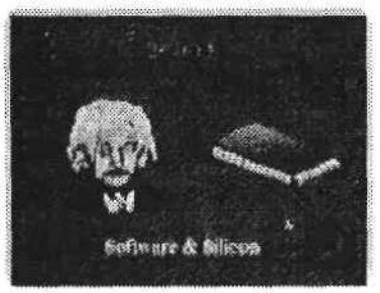
PICON資料

Apple Computer

VIDEO BANK

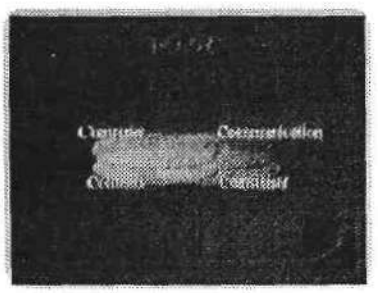
"マルチメディア戦略に賭る提携"

アップルコンピュータ株式会社
代表取締役社長
武内　重親



2つのS

Software & Silicon

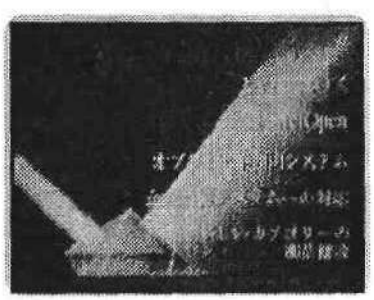


4つのC

Computer
Communication
Contents
Consumer

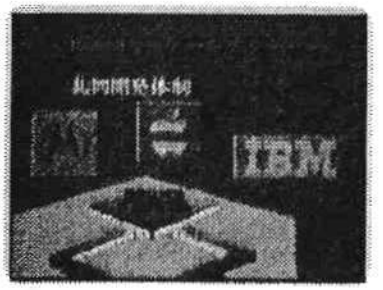
アップル社の製品デザイン構想
ー初めにコンセプトありきー

Concept
Architecture
Implementation



さらなる技術革新

より使いやすく
PowerOpen
オブジェクト指向システム
企業情報システムへの対応
新しいカテゴリーの商品構成



PowerOpenアーキテクチャ

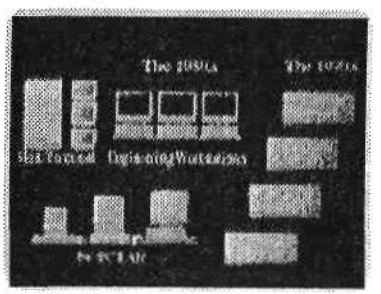
共同開発体制

CISCとRISCの共存

互換性と拡張性を維持

PowerOpenの優位性

革新的なヒューマン
インタフェイス
3Dのシミュレーション
自然言語の翻訳
ビデオ会議

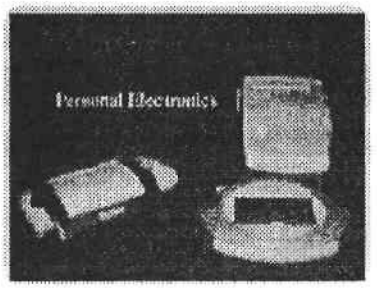


企業情報システムへの対応

The 1980's
The 1990's

新しいカテゴリーの商品構成

ペンベースシステム

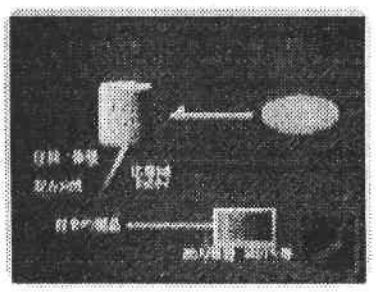


新しいカテゴリーの商品構成

Personal Electronics

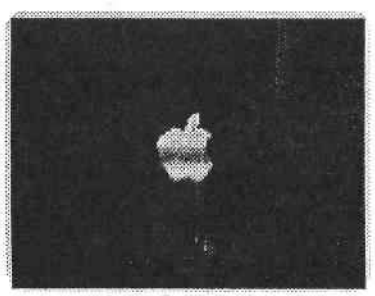
新しいカテゴリーの商品構成

Multimedia Alliances



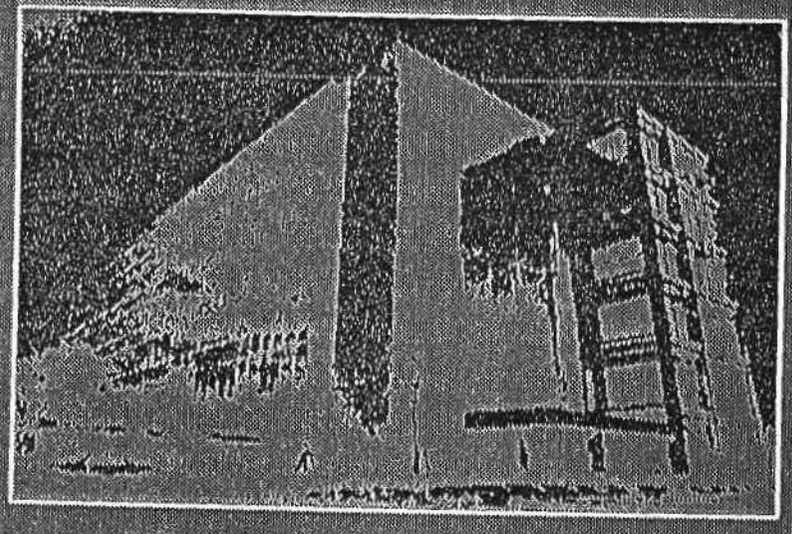
新しいカテゴリーの商品構成

将来の製品
Data Base
Content Provider
出力機器　HDTV等

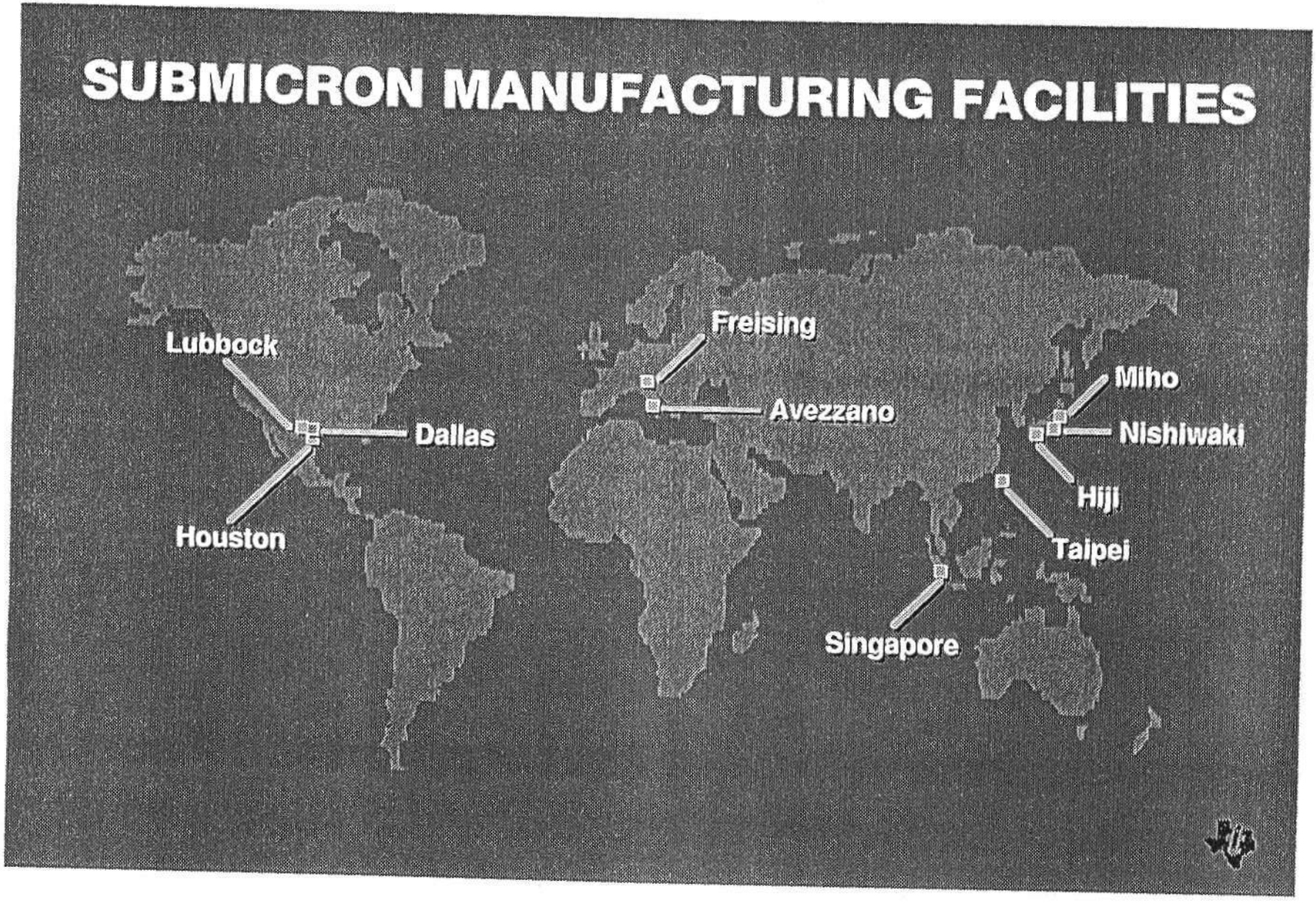


(Apple logo)

TEXAS INSTRUMENTS JAPAN
TSUKUBA R&D CENTER



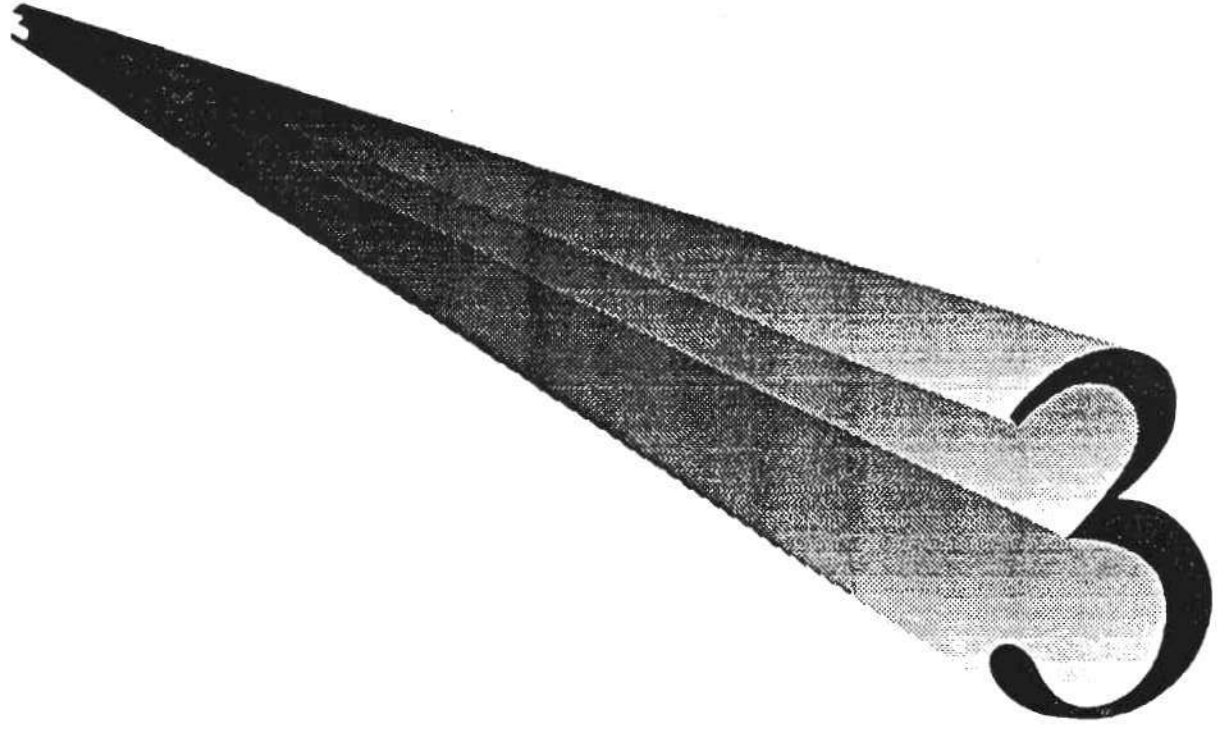
- Commitment to Asia - Pacific Region
- Collaborative Research
- Complement U.S. R&D Activities
- University Interface
- Participation in Technical Community


SUBMICRON MANUFACTURING FACILITIES
Lubbock
Dallas
Houston
Freising
Avezzano
Miho
Nishiwaki
Hiji
Taipei
Singapore

INTEL / SHARP PARTNERSHIP

William O. Howe
President
Intel Japan K.K.

1 + 1



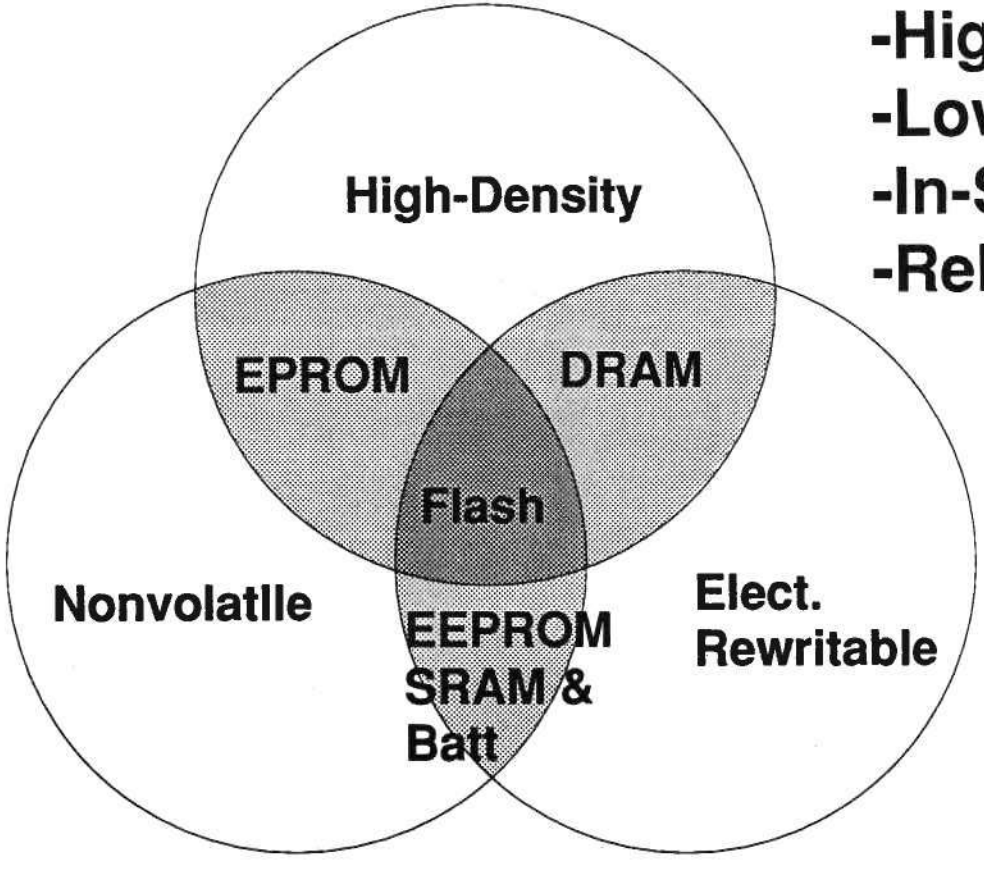
AGENDA

- What is Flash Memory?
  - Features
  - User Benefits
- Flash Memory Applications
  - Portable Computer Market
  - Consumer Electronics Market
- Intel/Sharp Partnership
- Real Industry Collaboration

WHAT IS FLASH MEMORY?

- Features
- End User Benefits

DEDICATED EQUIPMENT MEMORY REQUIREMENTS



- -High Functionality/Integration
- -Low Life Cycle Cost
- -In-System Update Capability
- -Reliable System-Level Update

FLASH MEMORY:
THE ENABLING TECHNOLOGY OF THE '90s

Flash Feature	End User Benefit
■ NV, Random-Access	Instant On
■ Small Form Factor	Lightweight, Truly Portable Updatable, Removable Media Modularity
■ Low Power	System Runs Longer Less Battery Weight
■ Solid State	Reliably Withstands Handling

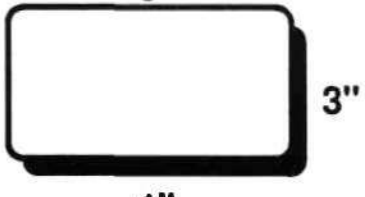
FLASH MEMORY APPLICATIONS

- Portable Computer Market
- Consumer Electronics Market

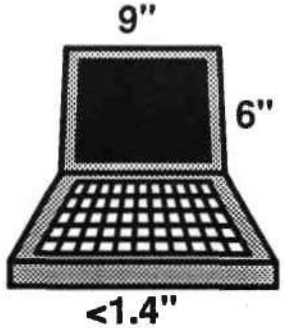
PORTABLE COMPUTING CATEGORIES

Functionality

Hand-Held
- Electronic Daytimer
- Less than 1Lb
- Storage less than 4MB
- Battery life=months
- No HDD or floppy
- PCMCIA slot



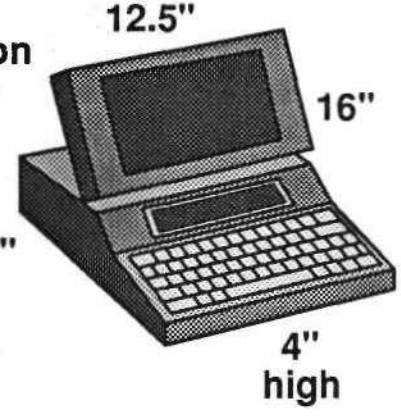
Sub-Notebook
- "Shuttle craft"
- 3-5Lbs.
- 20-80MB
- PCMCIA slot(s)
- No floppy
- Battery=4 Hr



Pen Tablet
- Vertical pen Apps/OS
- 3-5Lbs
- 20MB
- No floppy
- PCMCIA slot(s)
- Battery 3-4 Hr

Notebook
- Full PC
- Color VGA
- 5-8Lbs
- 60-120MB
- Battery 3-4 Hrs
- External Expansion

Laptop
- Full PC
- 10-20Lbs
- 80-200MB
- 2-3 Int slots
- Battery 2-3 Hrs



Price

PORTABLE PC END-USER REQUIREMENTS

PC FEATURE	END-USER BENEFITS
Higher Performance	Runs Desktop Software
Long Battery Life	10-20 Hours
Small Form Factor	"On the Arm" Portability
Lightweight	Approximatery 1-4 Lbs
Rugged	Will NOT Lose Data When Dropped

THE PORTABLE COMPUTING MEMORY DILEMMA

- Memory Structure is Borrowed from Desktop Computing
- Four Different Memory Types Used, but Each has Compromises in the Portable Environment
  - -DRAM:Volatile, Higher Power-Needs Disk
  - -SRAM:Low Density, Expensive-Needs Battery
  - -HDD:Bulky,Fragile,High Power-Needs DRAM
  - -EPROM/ROM:Not Re-Writable-Can't Update BIOS,OS,App's
- System Performance and Cost Suffers as Code, Data Moved from One Memory Type to Another

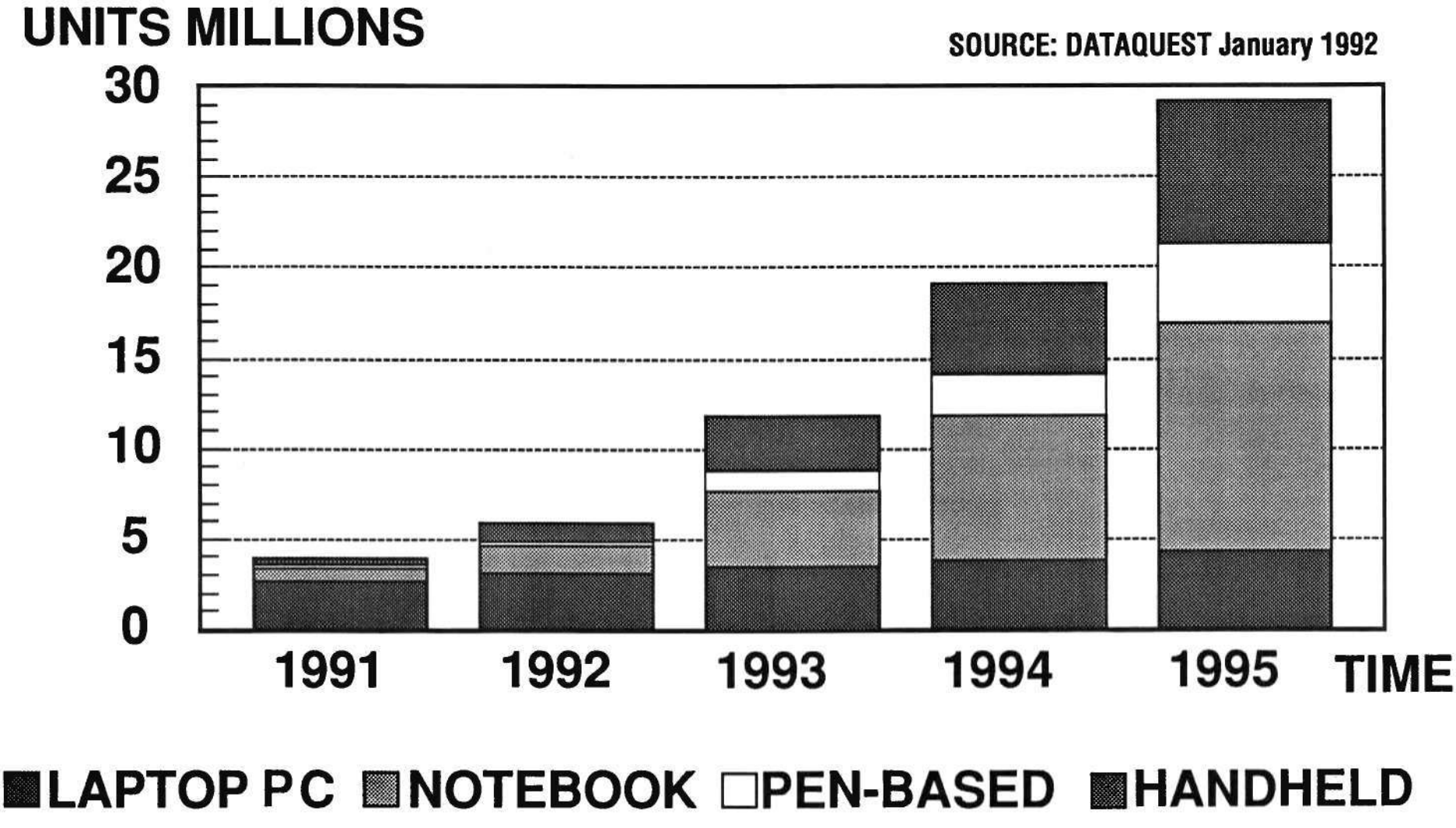
(Example:Disk ⇨ DRAM ⇨ SRAM Cache)

FLASH SOLVES THE PORTABLE COMPUTING DILEMMA

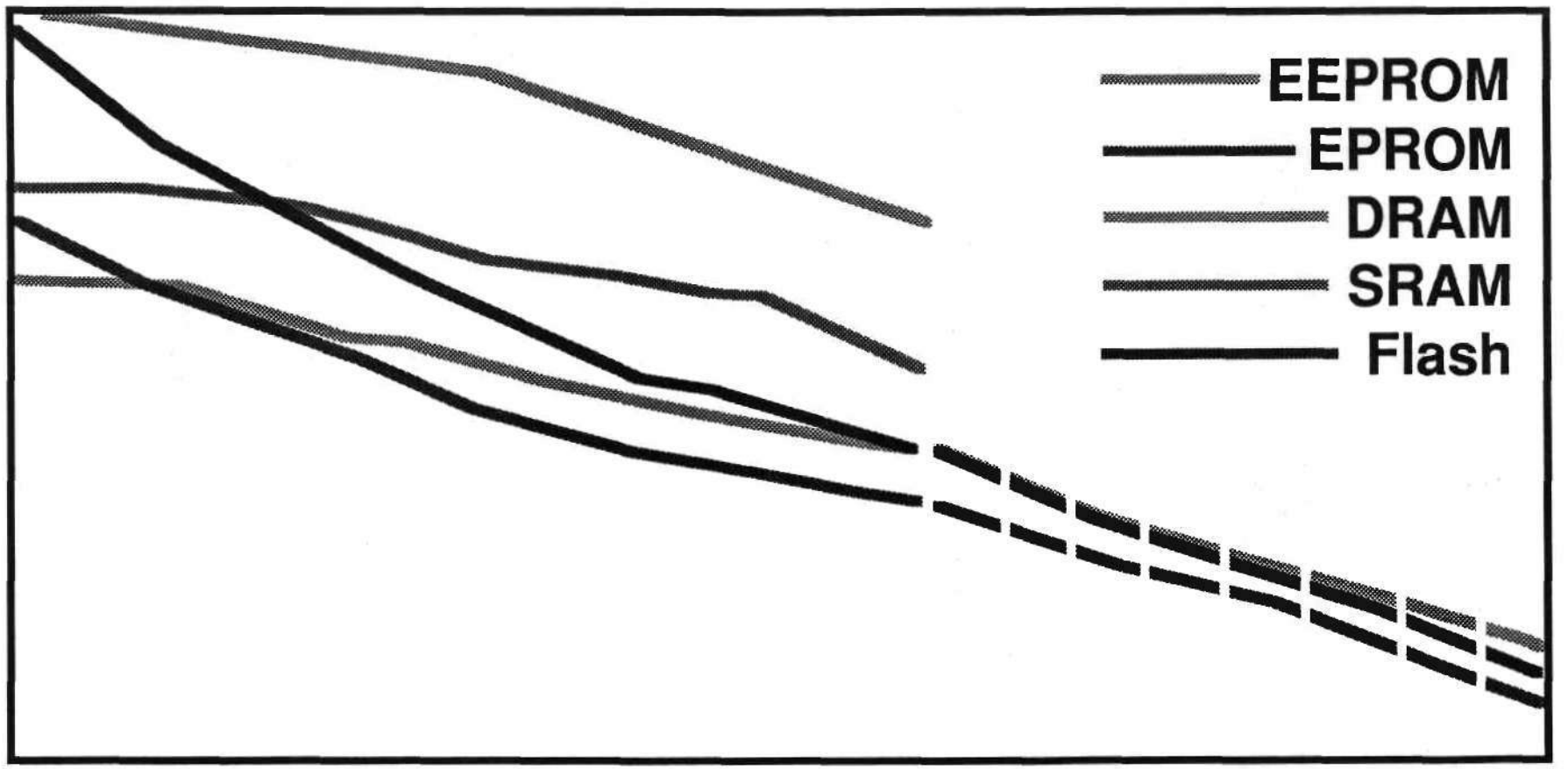
- **Flash Enables Portable Computers To Be:**

  - -Faster
  - -Lower Power
  - -Lighter, Smaller
  - -More Rugged
  - -A More Secure Data Storage Medium
  - -Low Cost
  - -Upgradable
  - -Silent

WORLDWIDE PORTABLE PC FORECAST

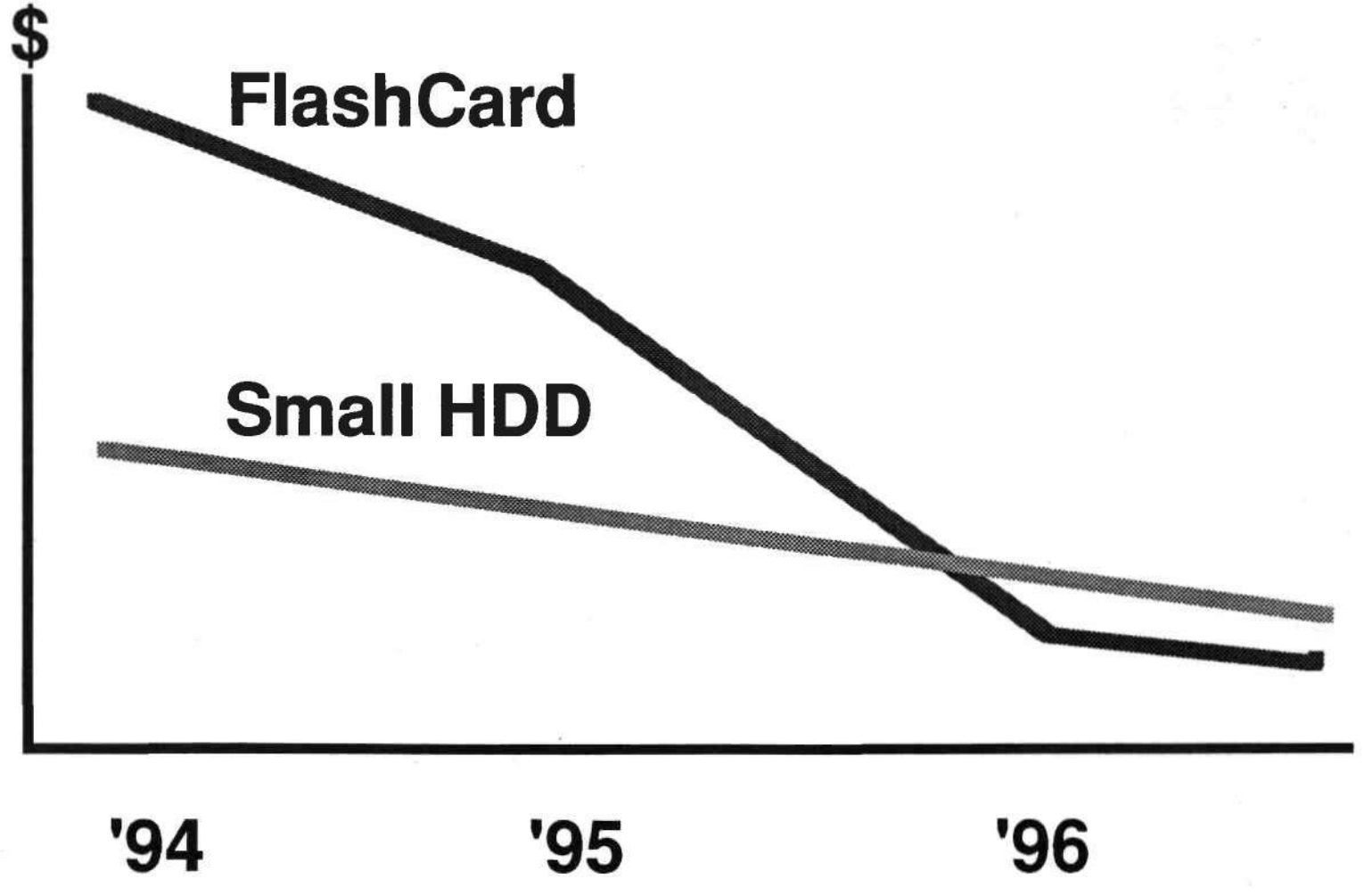


MEMORY LEADING COST/BIT PRICE LEARNING CURVES



Source: Dataquest
Projections:Intel

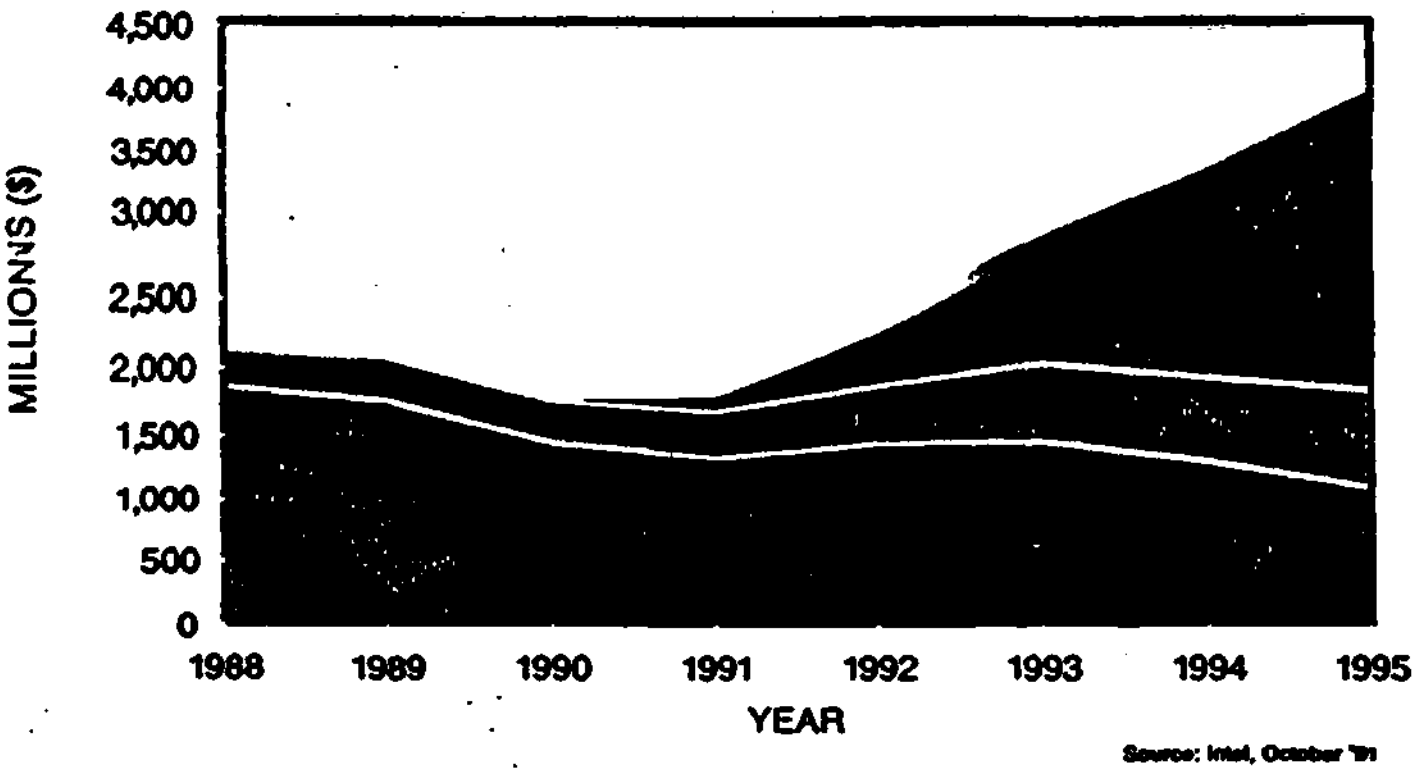
LEADING COST/MBYTE
SMALL HDD vs. FLASH



FLASH CARD APPLICATIONS

- Hand Held Portable Equipment/Components
  - Bar Code Readers
  - Medical Instrumentation Equipment
  - Palmtop Personal Computer
  - Notebook Personal Computer
  - Pen-Based Personal Computer
- Consumer Electronics
  - Musical Instruments
  - Digital Still Photography
  - Electronic Publishing

NONVOLATILE MEMORY MARKET GROWTH

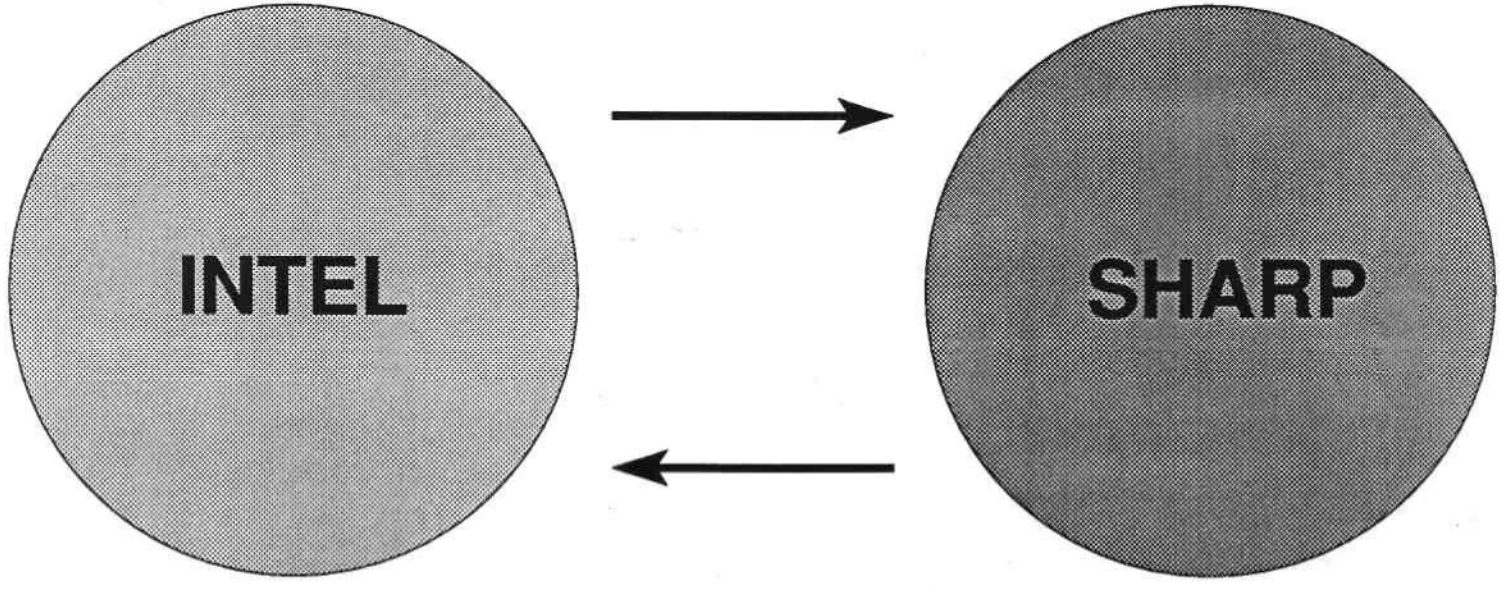


Source: Intel, October '91

INTEL/SHARP PARTNERSHIP

- Why tie-up between Intel and Sharp required
- Intel Flash Factory Network
- Expected Results

WHY TIE-UP BETWEEN INTEL AND SHARP REQUIRED



FLASH MEMORY TECHNOLOGY+ **CONSUMER ELECTRONICS APPLICATIONS**

FUTURE PORTABLE COMMUNICATION MEDIA MARKET

Intel/Sharp Partnership

Respective Strengths

- Intel is Flash Memory Market Leader - >85% Share of Market in 1991 Worldwide
- Intel's 1u ETOX™ process Technology Produces Today's Leading-Edge Flash Memory Products
- Sharp is a World-Class ROM Manufacturer With 8-inch Wafer Fabrication Capability
- Sharp is Leader in Consumer, Office and Industrial Electronics Products

Intel/Sharp Partnership

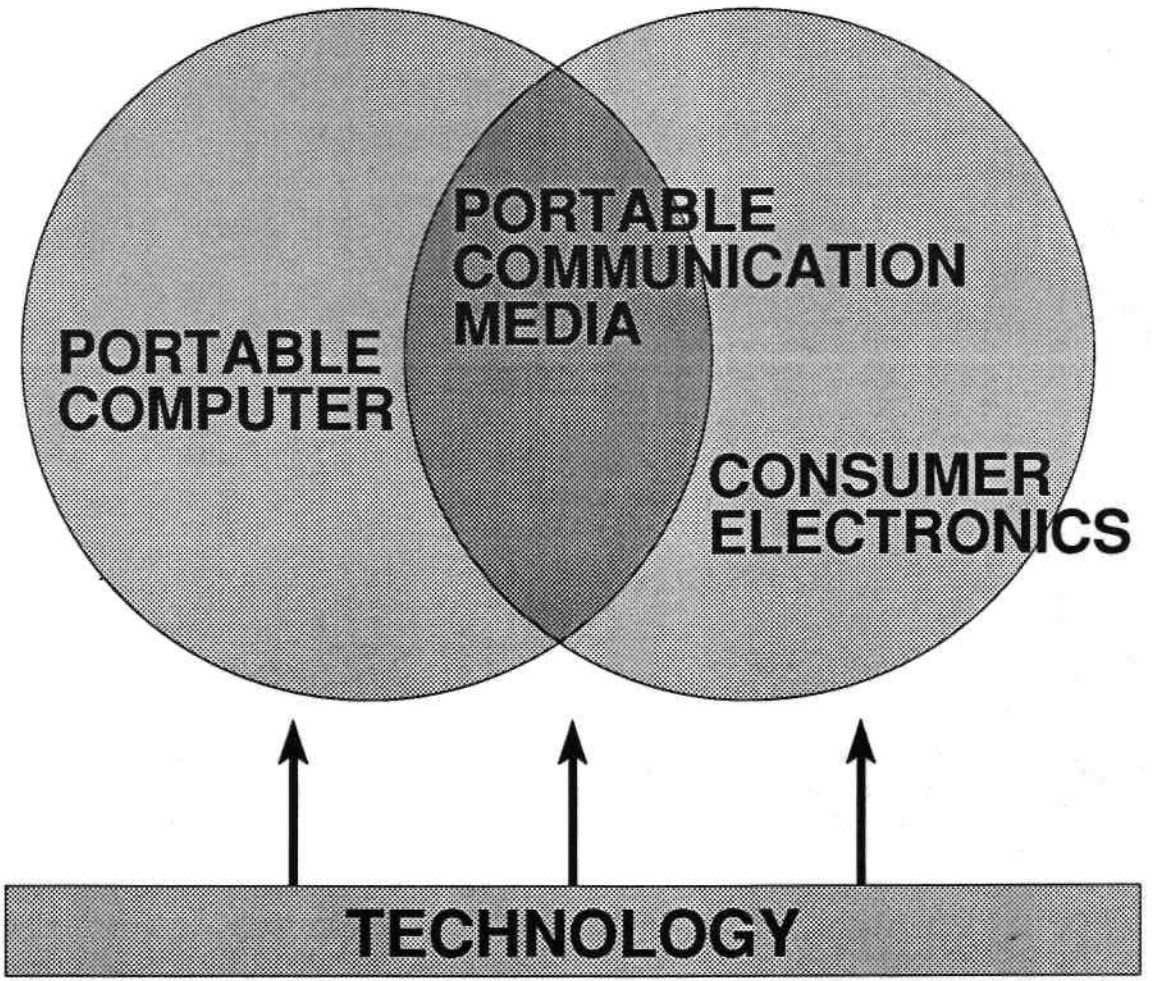
Contract Highlights

- Joint Development of Flash Memory Product Designs
- Joint Development of Future Process Technologies - .6u and Smaller
- Joint Manufacturing of Future Flash Products in High-Volume, 8-inch Wafer Fab - Production 1993
- Applications Development Within Consumer Electronics

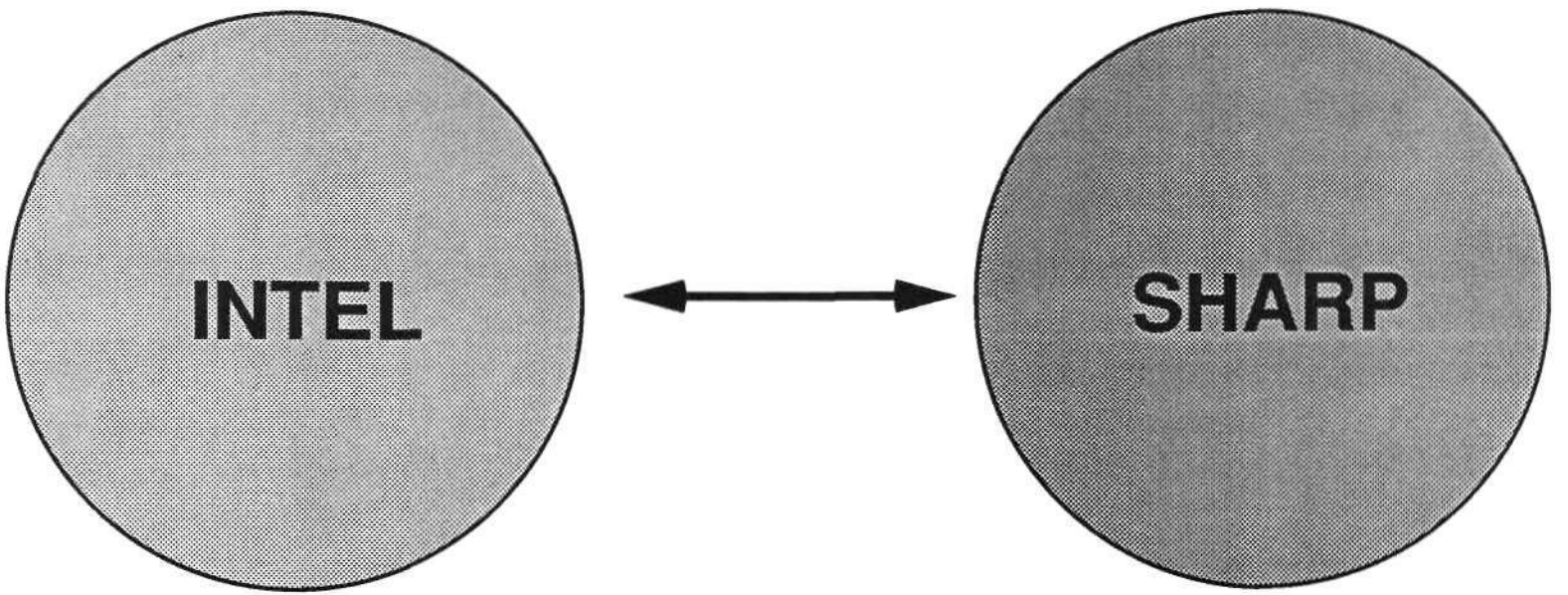
INTEL FLASH FACTORY NETWORK

FACTORY	PROCESS	PRODUCTION DATE
Intel Fab 7	1.0 micron	1989 →
Intel D2	0.8 micron	1991 - 1992
NMBS	0.8 micron	1992 →
Sharp	0.6/0.4 micron	1994 →

EXPECTED RESULTS



A REAL GLOBAL PARTNERSHIP



U.S. **JAPAN**

Collaboration for
Technology and Market Development

SUMMARY

- Flash memory is an enabling technology of 90s
  featuring High density
  Nonvolatile
  Rewritable

↓

- INTEL/SHARP Partnership
- Technology Development

↓

- Expected Results
  - Expansion of flash memory markets for portable computers
  - New application in consumer electronics
- Real Industry Collaboration

Japanese Semiconductor Industry Conference

April 13-14, 1992
Tokyo Hilton Hotel
Tokyo, Japan

Dataquest

a company of The Dun & Bradstreet Corporation

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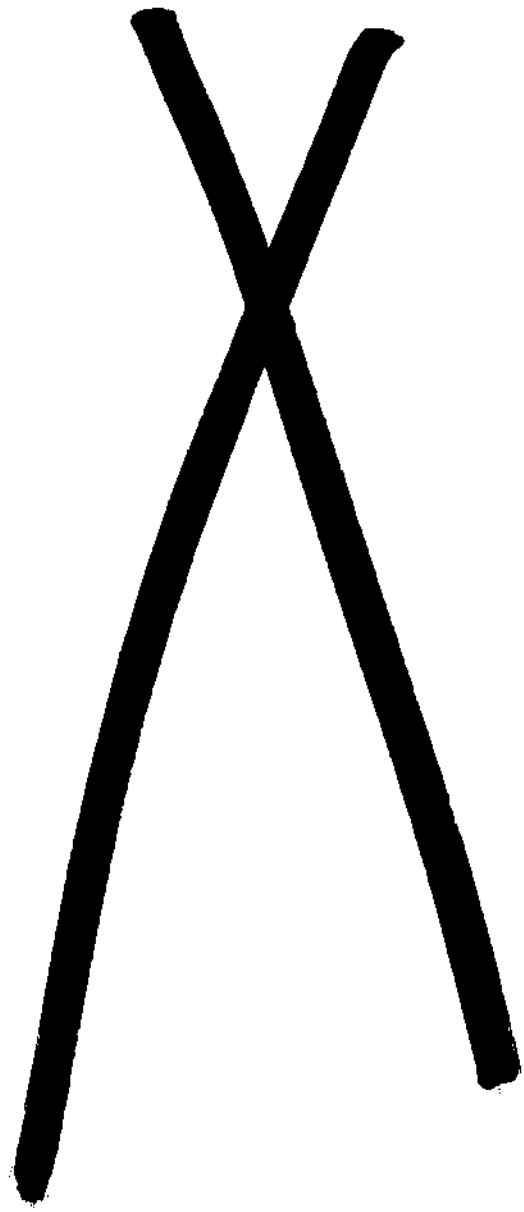

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1992 Japanese Semiconductor Industry Conference

"Alliances in a Changing Semiconductor Industry"

April 13-14, 1992
Tokyo Hilton Hotel
Tokyo, Japan

Monday, April 13

8:30 a.m. **Registration**

9:00 a.m. ■ ***Welcoming Remarks***
Robert J. Lievense, Chairman
Dataquest Incorporated

9:10 a.m. ■ ***Alliances to the Benefit of Equipment Manufacturers***
Igor Dorochevsky
Corporate Vice President, SGS-THOMSON Microelectronics Group
Chairman, SGS-THOMSON Microelectonics K.K.

9:40 a.m. ■ ***Global Alliance Strategies***
Kiyoji Ishida, Senior Managing Director and General Manager
IBM Japan, Ltd.

10:10 a.m. **Coffee Break**

10:30 a.m. ■ ***U.S. Semiconductor Industry and Alliances***
Arnold S. Brenner, Executive Vice President
Motorola Inc.

11:00 a.m. ■ ***Responding to SIA Design-In Activities***
Norman P. Neureiter, Chairman
The Japan Chapter of the U.S. Semiconductor Industry Association

11:30 a.m. ■ ***International Cooperation in the Semiconductor Industry***
Nobuhiro Miyake, Director
Industrial Electronics Division, Machinery and Information Industries Bureau
Ministry of International Trade and Industry

12:00 p.m. **Lunch**

1:10 p.m. ■ ***Globalization and Alliances***
Hajime Sasaki, Senior Vice President and Director of the Board
NEC Corporation

1:40 p.m. ■ ***Semiconductor Business and the Role of Alliances***
Hideharu Egawa, Senior Vice President and Director of the Board
Group Executive, Semiconductor Group
Toshiba Corporation

2:10 p.m. ■ ***Semiconductor Strategic Alliances with Foreign Venders***
Kazuo Kimbara, Senior Executive Managing Director and Group Executive
Electronic Devices Group
Hitachi, Ltd.

2:40 p.m. ■ ***Semiconductor Strategies in the European Semiconductor Industry***
Takashi Kitaoka, Executive Vice President and Director of the Board
Mitsubishi Electric Corporation

3:10 p.m. ■ ***Consumer Electronics Market and Alliances***
Tatsuo Kawasaki, Senior Managing Director
Matsushita Electronics Corporation

3:40 p.m. **Coffee Break**

4:00 p.m. ■ **PANEL DISCUSSION:** ***How Alliances Foster International Cooperation***

5:30 p.m. **Cocktails**

Tuesday, April 14

9:00 a.m. ■ ***TECH Semiconductor: A New Semiconductor Alliance in Singapore***
David V. Smith, President
TECH Semiconductor Singapore Pte., Ltd.

9:30 a.m. ■ ***Korean Semiconductor Industry and Strategic Alliances***
C.S. Park, Senior Vice President
Hyundai Electronics Industries Co., Ltd.

10:00 a.m. ■ ***Taiwan: Ready and Perfect Position for Future IC Industry Growth***
John Hsuan, President
United Microelectonics Corporation

10:30 a.m. **Coffee Break**

10:50 a.m. ■ ***Foreign-Based Companies' Perspective on International Partnerships***
Sachiaki Nagae, Representative Director and President
Texas Instruments Japan, Ltd.

11:20 a.m. ■ ***Global Partnerships between Semiconductor Equipment and Devices in the 1990s***
Akira Inoue, President and CEO
Tokyo Electron Limited

11:50 a.m. **Lunch**

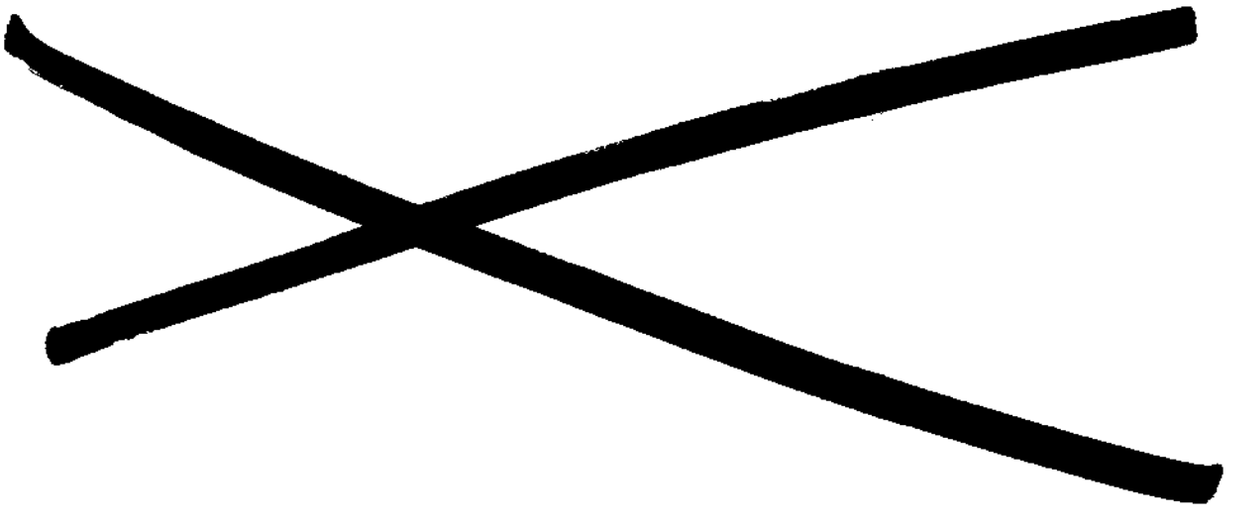
1:00 p.m. ■ ***Strategic Alliance for Multimedia***
Shigechika Takeuchi
Vice President, Apple Computer, Inc.
President, Apple Japan, Inc.

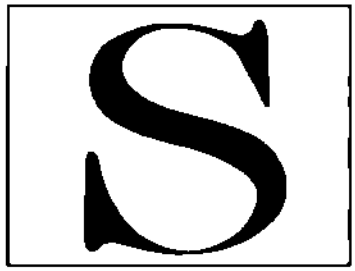
1:30 p.m. ■ ***Overview of Semiconductor Industry in the 1990s***
William O. Howe, President
Intel Japan K.K.

2:00 p.m. ■ ***Memory Alliances: Steady State Solution or Prelude to Consolidation?***
Lane Mason, Director and Principal Analyst
Dataquest Incorporated

2:30 p.m. ■ ***Closing Remarks***
Masahiro Miyagawa, President
Dataquest Japan Limited

2:40 p.m. **Conference Adjourns**





Welcome and Opening Remarks

Robert J. Lievence
Chairman
Dataquest Incorporated

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Alliances to the Benefit of Equipment Manufacturers

Igor Dorochevsky
Chairman
SGS-THOMSON Microelectronics K.K.
Corporate Vice President
SGS-THOMSON Microelectronics Group

Mr. Dorochevsky is Chairman of SGS-THOMSON Microelectronics K.K. in Japan and is also Corporate Vice President of SGS-THOMSON Microelectronics Group in France. He joined Thomson-CSF in France in 1962 and worked in Thomson's German offices from 1962 to 1986 as Product Marketing Engineer and Managing Director of Thomson Components. In 1987, Mr. Dorochevsky was appointed Vice President of Marketing in the Asia/Pacific Region and moved to Hong kong for two years. In 1989, he was promoted to President of SGS-THOMSON's Japanese operation and became Corporate Vice President. He was appointed to his present position in January 1992. Mr. Dorochevsky graduated from the University of Paris with a major in Electronics Engineering.

Dataquest Incorporated
JAPANESE SEMICONDUCTOR INDUSTRY CONFERENCE
April 13-14, 1992
Tokyo, Japan

Alliances to the Benefit of Equipment Manufacturers

Igor Dorochevsky
Chairman, SGS-THOMSON Microelectronics K.K.
Corporate Vice President, SGS-THOMSON Microelectronics Group

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Global Alliance Strategies

Kiyoji Ishida
Senior Managing Director and General Manager
Asia Pacific Technical Operations
IBM Japan, Ltd.

Mr. Ishida is Senior Managing Director and General Manager of Asia Pacific Technical Operations in IBM Japan, Ltd. He is responsible for directing R&D and manufacturing operations for worldwide and Asia-Pacific, including Japan.
Mr. Ishida joined IBM Japan as a production design engineer in 1961.Since then he has held various management positions in both IBM Japan and IBM's headquarters in the United States. In 1985, he became Director of Fujisawa Laboratory. He joined the IBM Japan board of directors in 1986. In 1989 and 1990, he was moved to the United States as Assistant General Manager of the Technology Products line of business. He was appointed to his present position in 1991. Mr. Ishida holds a B.S. degree in Electric Engineering from Keio University and an M.S. degree from Northwestern University.

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JAPANESE SEMICONDUCTOR INDUSTRY CONFERENCE
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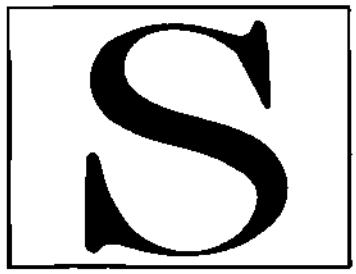

Global Alliance Strategies

Kiyoji Ishida
Senior Managing Director and General Manager
Asia Pacific Technical Operations
IBM Japan, Ltd.

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U.S. Semiconductor Industry and Alliances

Arnold S. Brenner
Executive Vice President and General Manager
Japanese Group
Motorola Inc.

Mr. Brenner is Executive Vice President and General Manager of the Japanese Group of Motorola Inc. Since Joining Motorola in 1959, he has held positions as Vice President and Director of the mobile products operations, Vice President and General Manager of the International Products Division, and Senior Vice President and Director of the Communications Sector's International Group. In 1987, he was appointed Deputy General Manager of Motorola's Japanese operations. He became General Manager at the beginning of 1988, and later that year was elected Executive Vice President. Mr. Brenner has line management responsibility for all of the company's operations in Japan. He is also a member of Motorola's operating and policy committees, which report to the CEO. Mr Brenner has a bachelor's degree in Electrical Engineering from the Illinois Institute of Technology and an M.S.E.E. degree from the University of Illinois. He has done postgraduate work at Northwestern University.

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JAPANESE SEMICONDUCTOR INDUSTRY CONFERENCE
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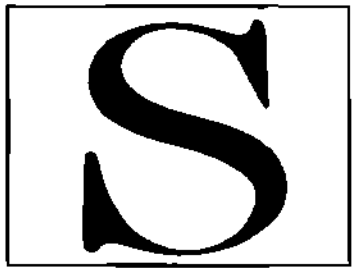

U.S. Semiconductor Industry and Alliances

Arnold S. Brenner
Executive Vice President and General Manager
Japanese Group
Motorola Inc.

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Responding to SIA Design-in Activities

Norman P. Neureiter
Chairman
The Japan Chapter of the Semiconductor Industry Association

Dr.Neureiter is Chairman of the Japan Chapter of the Semiconductor Industry Association. He is also Corporate Vice President of Texas Instruments. In 1957, Dr.Neureiter joined Humble Oil and Refining Company (now part of Exxon Corporation) as a research chemist, where he received ten patents and authored a number of articles for scientific publications. During this time, he also was an instructor of German and Russian at the University of Houston. Dr.Neureiter became involved in U.S. government services in 1959, and held various international and scientific positions, including Program Director of the U.S.-Japan Cooperative Science Program at the National Science Foundation (NSF) and Deputy Scientific Attache at the U.S. Embassy in Germany. In 1969, he relocated to Washington, D.C. as International Affairs Assistant in the White House Office of Science and Technology. In 1973, he left the government and joined Texas Instruments, where he held a variety of management positions. In 1989, Dr.Neureiter was transferred to Texas Instruments Japan with broad responsibility for representing the corporation in Japan. He was appointed to his present SIA position in 1991. Dr.Neureiter holds a B.S. degree in Chemistry from the University of Rochester and a Ph.D. degree in Organic Chemistry from Northwesten University. He also studied at the University of Munich for two years as a Fulbright Fellow.

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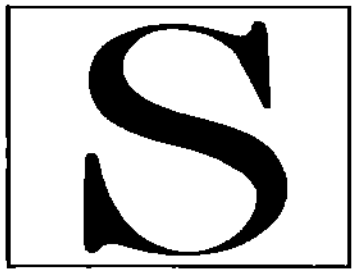

Responding to SIA Design-In Activities

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Chairman
The Japan Chapter of the Semiconductor Industry Association

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International Cooperation in the Semiconductor Industry

Nobuhiro Miyake
Director
Industrial Electronics Division
Machinery and Information Industries Bureau
Ministry of International Trade and Industry

Mr. Miyake is Director of the Industrial Electronics Division, Machinery and Information Industries Bureau (MIIB), in the Ministry of International Trade and Industry (MITI). He joined MITI in 1969 and has served in various technology management positions including Aircraft and Ordnance Division, Nuclear Power Division, Electronics Policy Division, Industrial Machinery Division, and Industrial Electronics Division. From 1983 to 1986, he was assigned to the Japan External Trade Organization (JETRO) San Francisco office as Director of Technology. In 1989, he became General Manager of the Loan Department, Japan Key Technology Center. He was appointed to his present position in 1991. Mr. Miyake holds B.E. and M.E. degrees from Tokyo University.

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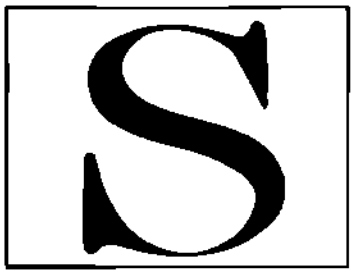

International Cooperation in the Semiconductor Industry

Nobuhiro Miyake
Director
Industrial Electronics Division
Machinery and Information Industries Bureau
Ministry of International Trade and Industry

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Globalization and Alliances

Hajime Sasaki
Senior Vice President and Director of the Board
NEC Corporation

Mr. Sasaki is Senior Vice president in charge of Semiconductor Operations at NEC Corporation. Previously, he was Associate Senior Vice President, Vice President, General Manager of the Microcomputer Products Division, and General Manager of the VLSI Development Division. Mr. Sasaki started his managerial career as a Manager of the IC Design Engineering Department in the IC Division. He received a master of Engineering degree from Tokyo University.

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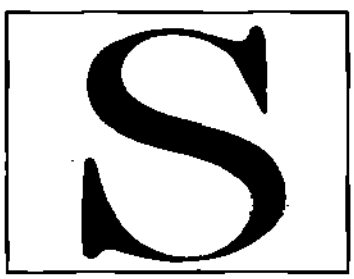


Globalization and Alliances

Hajime Sasaki
Senior Vice President and Director of the Board
NEC Corporation

C&C COMPUTER AND COMMUNICATIONS

GLOBALIZATION & ALLIANCES

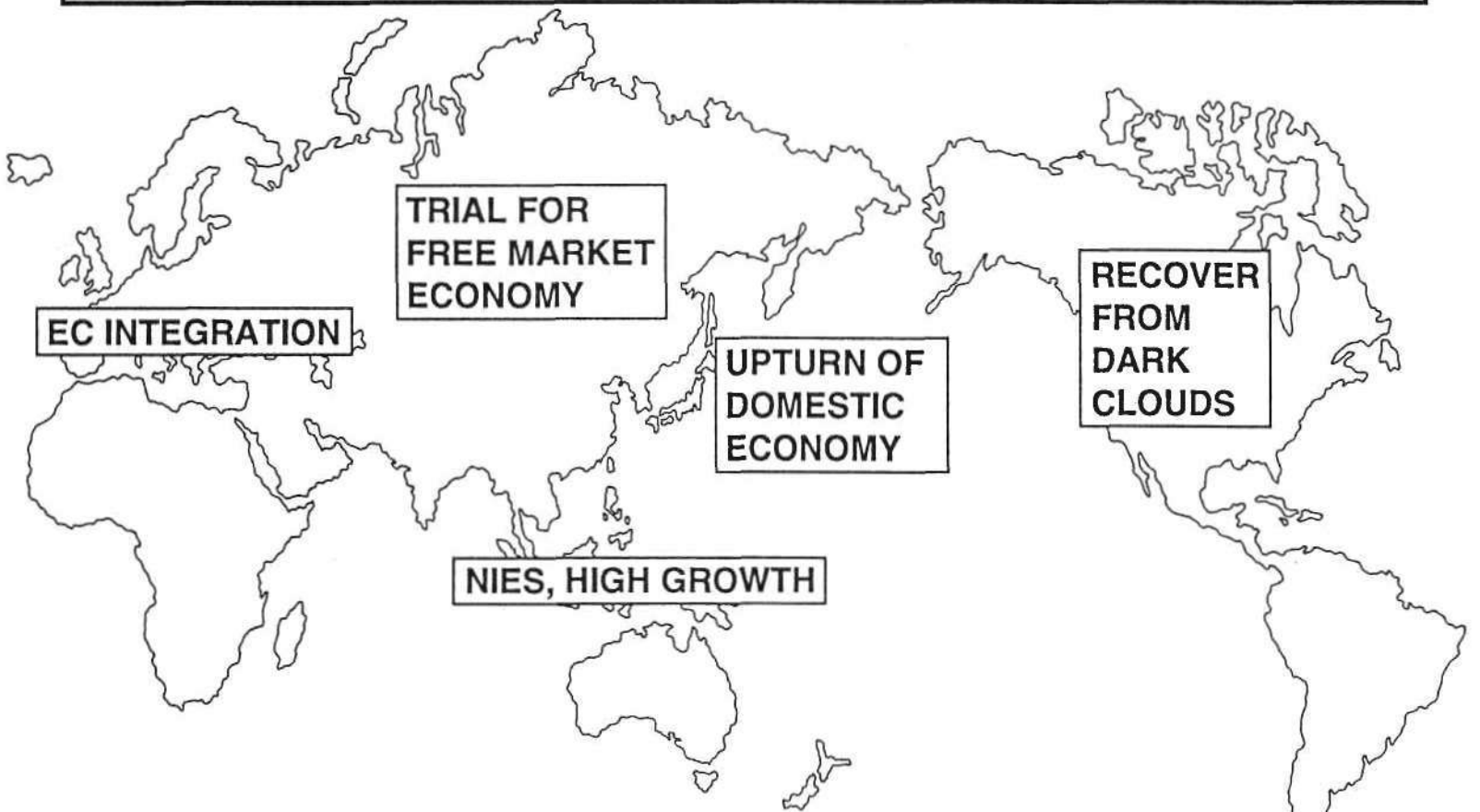
HAJIME SASAKI

Senior Vice President
NEC Corporation

NEC

C&C COMPUTER AND COMMUNICATIONS

THE CURRENT OF THE WORLD (TOWORD NEW ECONOMIC FRAMEWORK)



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C&C COMPUTER AND COMMUNICATIONS

CHANGING IN ELECTRONIC EQUIPMENTS MARKET

	'70s	'80s	'90s
Market Growth	Introduction ⇨ Growth	Growth	Maturity (Saturation)
Demand	New	New ⇨ Replace	Replace
Market Driver	Technology	Technology	Customer Needs
Market Needs	High Function, High Performance		High Performance (Customer Satisfaction)

NEC

SEMICONDUCTOR INDUSTRY IN '90s

- SWELLING RESOURCES FOR SEMICONDUCTOR BUSINESS GROWTH

  ⇨ LIMITATION OF WORKFORCE, INVESTMENT, etc.

- MISMATCH TO MARKET NEEDS

  ⇨ VARIOUS NEEDS BUT TOO MUCH FUNCTION

- INCREASING TRADE FRICTION

  ⇨ A COOPORATION

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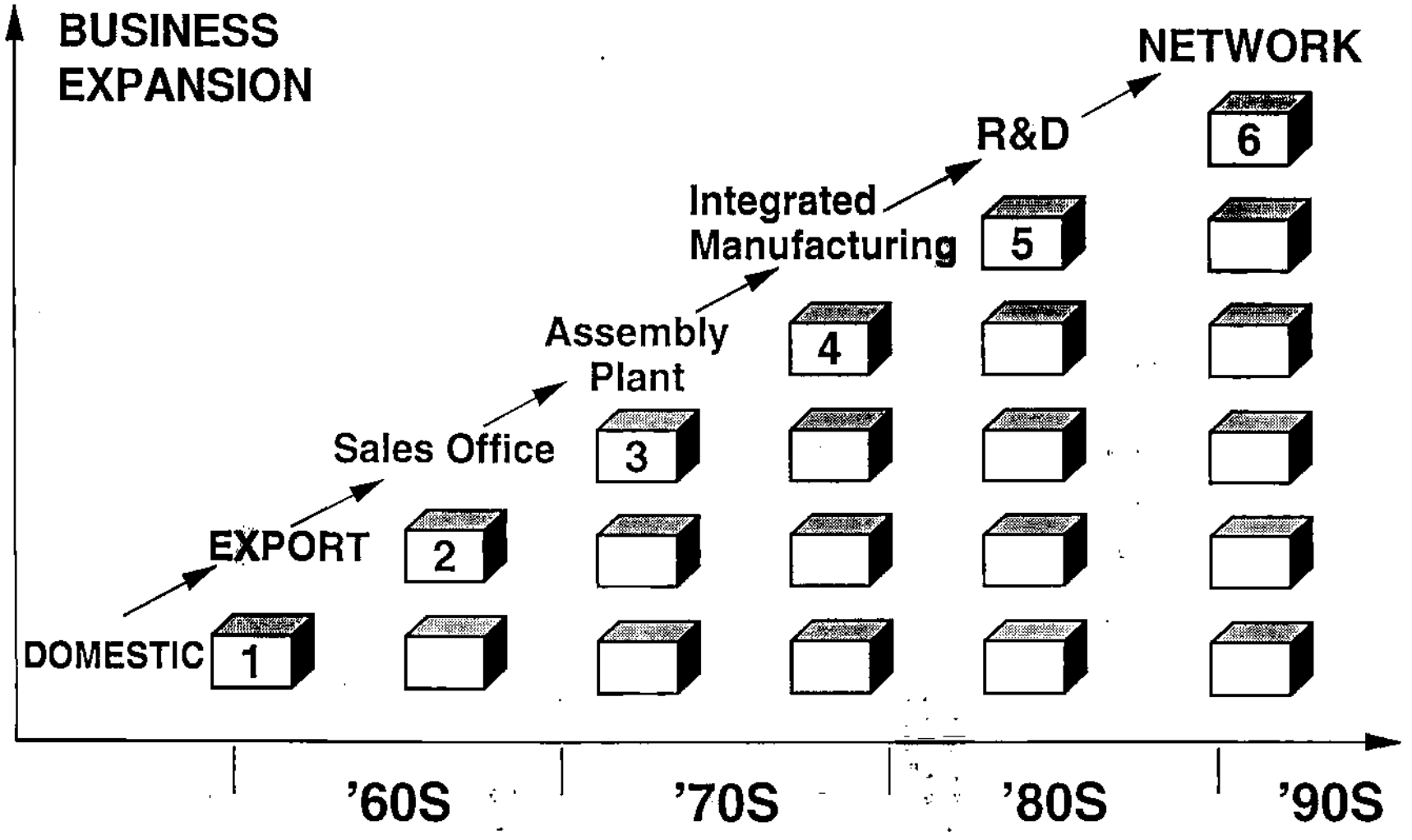
C&C COMPUTER AND COMMUNICATIONS

6 STEPS OF GLOBALIZATION



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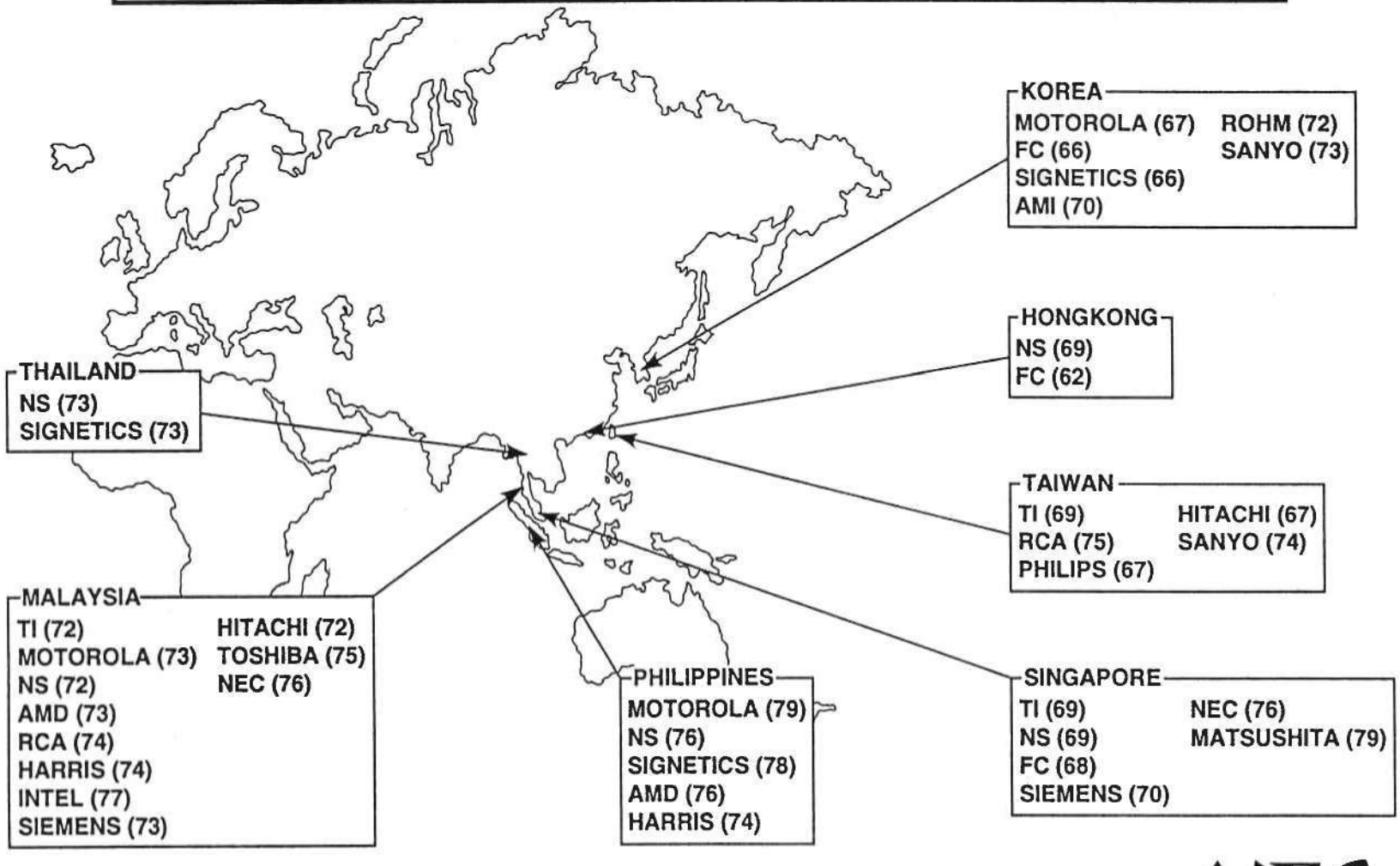
SEMICONDUCTOR MANUFACTURERS IN ASIA UP TO '70s



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INVESTMENT INCENTIVES BY ASIAN COUNTRIES (~'70s)

	SINGAPORE	MALAYSIA	PHILIPPINES
Qualifying Activities	• Introduce Technology & Service Activities	• Introduce Technology • Export of Products	• Export of Products • Labor Intensive
Tax Incentives	Pioneeer Status, etc.	Pioneeer Status, etc.	Pioneeer Status, etc.

NEC

FEATURES OF ELECTRONIC INDUSTRY IN '80s

- HIGH VALUE ADDED EQUIPMENT
  - ⇨ VCR, PC BOOMING
- EXPANDING THE MANUFACTURING, SALES ORGANIZATION
- ENTRY OF ASIAN MAKERS
  - ⇨ HARD COMPETITION
- TRADE FRICTION ⇨ TO SET UP INTEGRATED MANUFACTURING PLANTS IN USA & EUROPE

C&C COMPUTER AND COMMUNICATIONS

U.S SEMICONDUCTOR FABS IN EUROPE

SCOTLAND
DEC (I)
NS (I)
MOTOROLA (I)

ENGLAND
TI (I)
LSI LOGIC (I)
AMD (A)
HARRIS (A)

IRLAND
AMD (A)
ANALOG DEVICES (I)

I = Integrated
A = Assembly

GERMANY
LSI LOGIC (A)
IBM (I)
TI (I)
NS (I)
MOTOROLA (I)

ITALY
TI (I)

FRANCE
MOTOROLA (I)
TI (A)
IBM (I)

PORTUGAL
TI (A)

SPAIN
AT & T (I)

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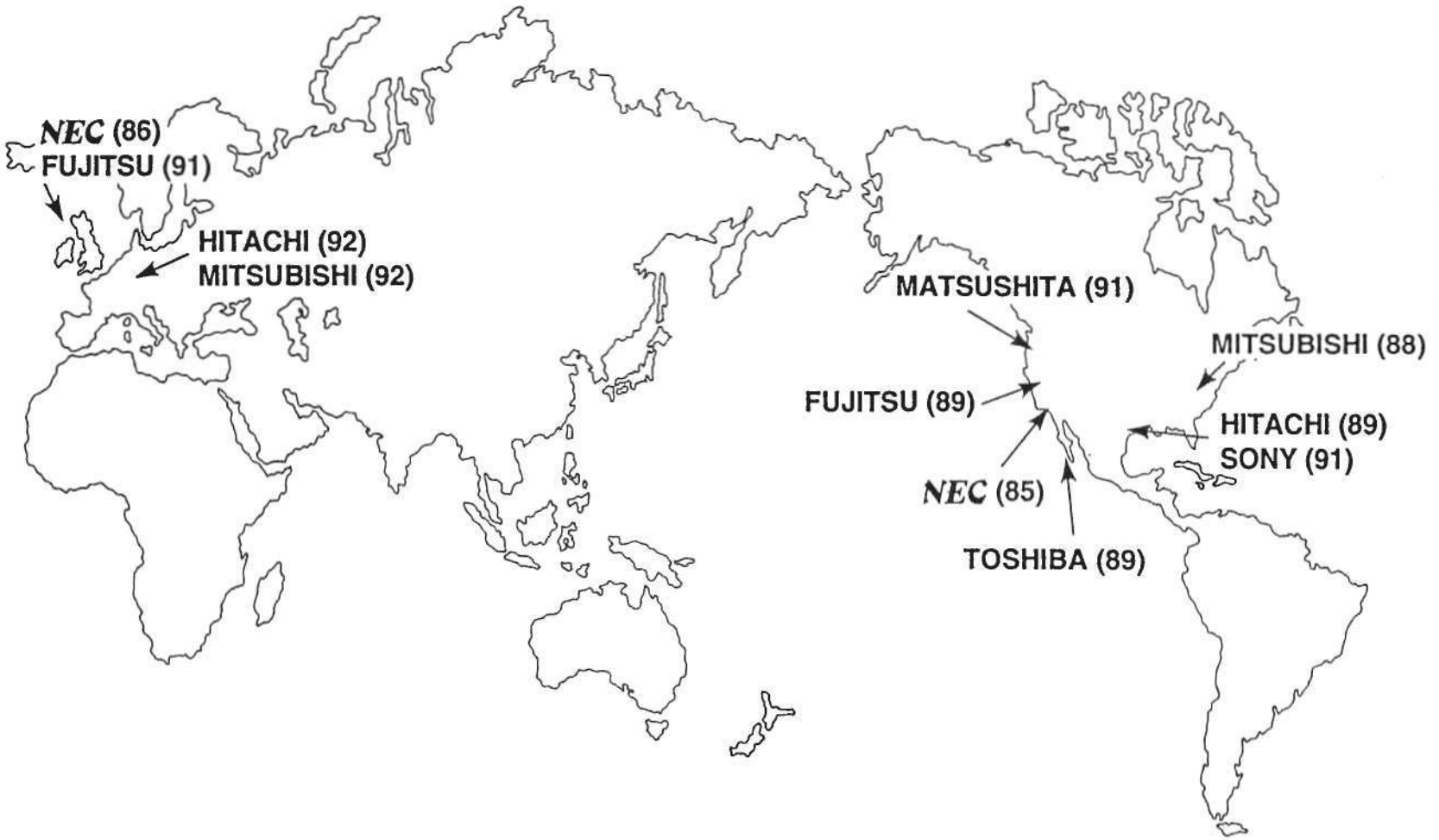
C&C COMPUTER AND COMMUNICATIONS

WAFER FAB PLANTS (Japanese Suppliers)



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BASIC POLICY OF NEC'S GLOBALIZATION

1. PRODUCTION WITHIN THE MARKET
   TO SUPPORT REGIONAL NEEDS

2. AFFILIATES TO BE PLACED
   IN THE MOST SUITABLE LOCATIONS

NEC

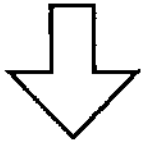
DEFINITE MEASURES

- CUSTOMER SATISFACTION
  - ⇨ LOCAL CUSTOMER SERVICE
- LOCAL CITIZENSHIP THROUGH VARIOUS CONTRIBUTIONS
- AVOIDING TRADE FRICTION
- USE OF THE LOCAL INVESTMENT INCENTIVES

NEC

PHILOSOPHY FOR MANUFACTURING

- USE OF THE MOST ADVANCED EQUIPMENT AS IN JAPAN
- PRODUCTION OF VARIOUS PRODUCTS TO SUPPORT THE MARKET
- WORLDWIDE PRODUCTION INFORMATION NETWORK



ESTABLISHMENT OF MULTI-SUPPLEMENTARY SYSTEM

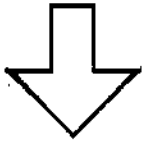
NEC

NEC GLOBALIZATION STEP

'70s — ESTABLISHMENT OF MANUFACTURING & SALES ORGANIZATION

'80s — COMPLETION OF ORGANIZATION IN FOUR MAJOR MARKETS

'90s — EXPANSION OF OVERALL NETWORK SYSTEM



MESH GLOBALIZATION

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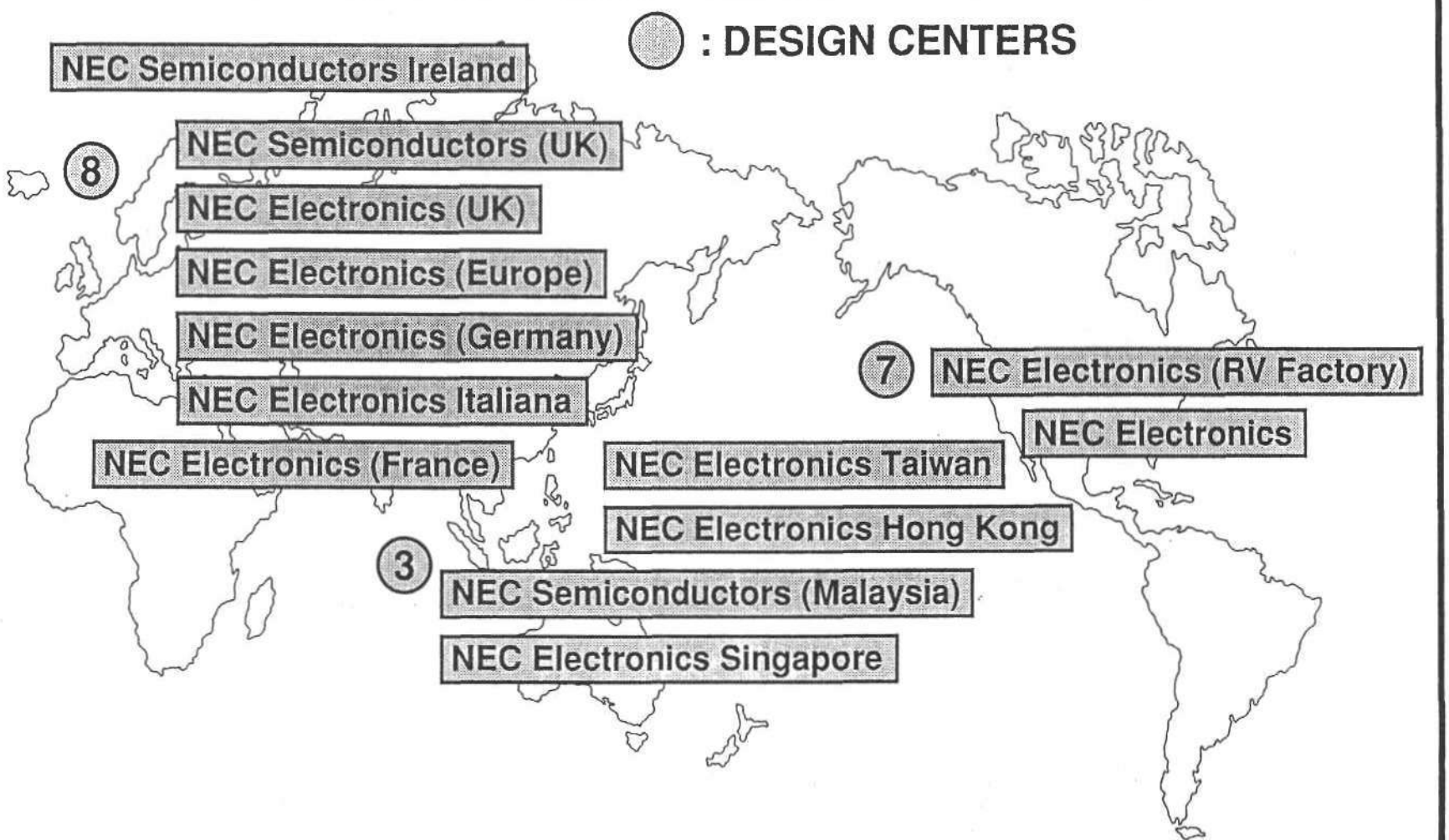
OVERSEAS SUBSIDIARIES



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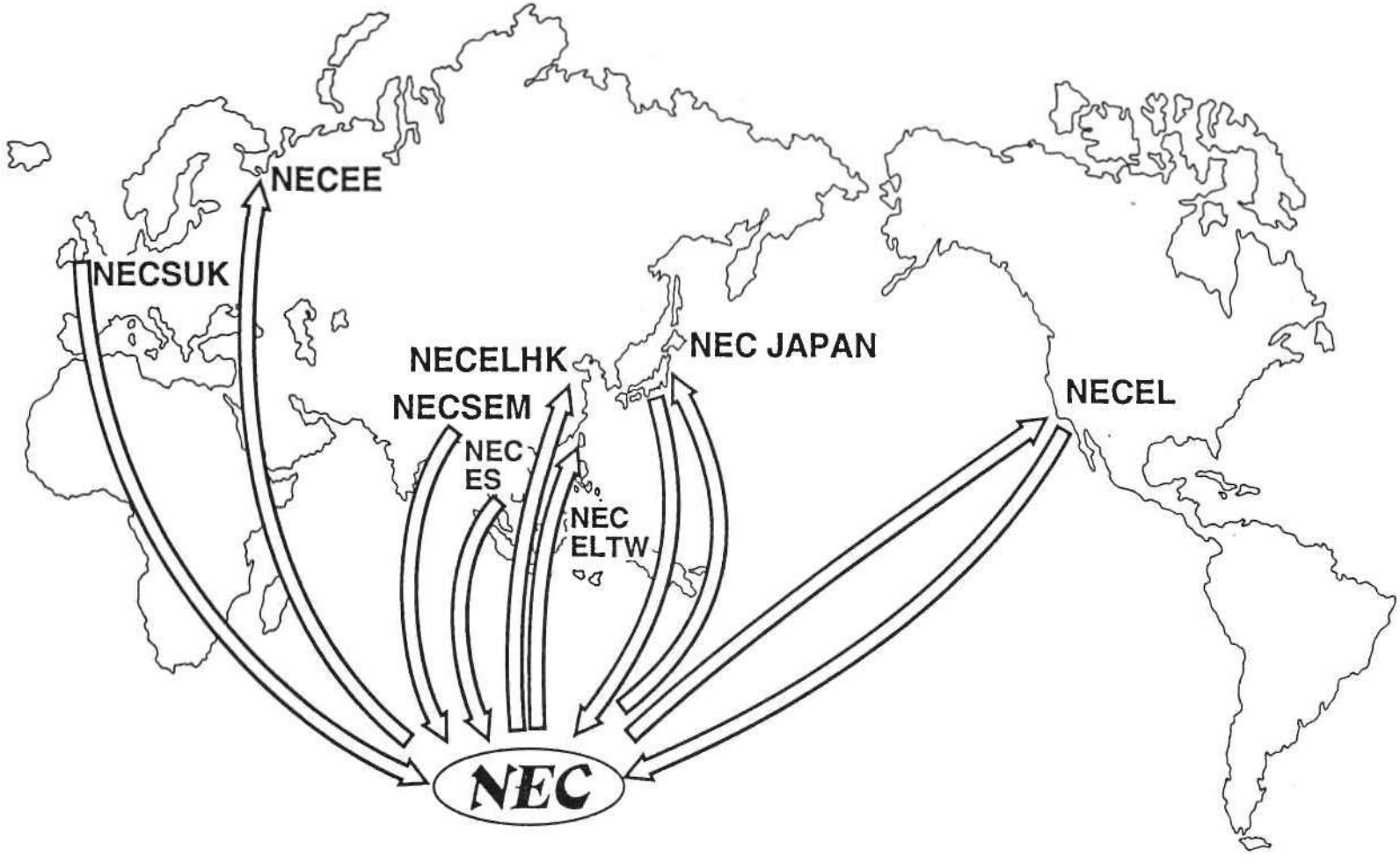
MESH GLOBALIZATION



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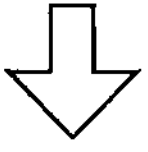
C&C COMPUTER AND COMMUNICATIONS

ALLIANCES

A big factor to promote globalization



Global partnership

NEC

VIEWPOINT ON ALLIANCES AND INVESTMENT POLICY

	'70~85		'85~
JAPANESE	DIRECT INVESTMENT	⇨	ALLIANCE, DIRECT INVESTMENT
AMERICAN EUROPEAN	DIRECT INVESTMENT, M&A	⇨	ALLIANCE, DIRECT INVESTMENT

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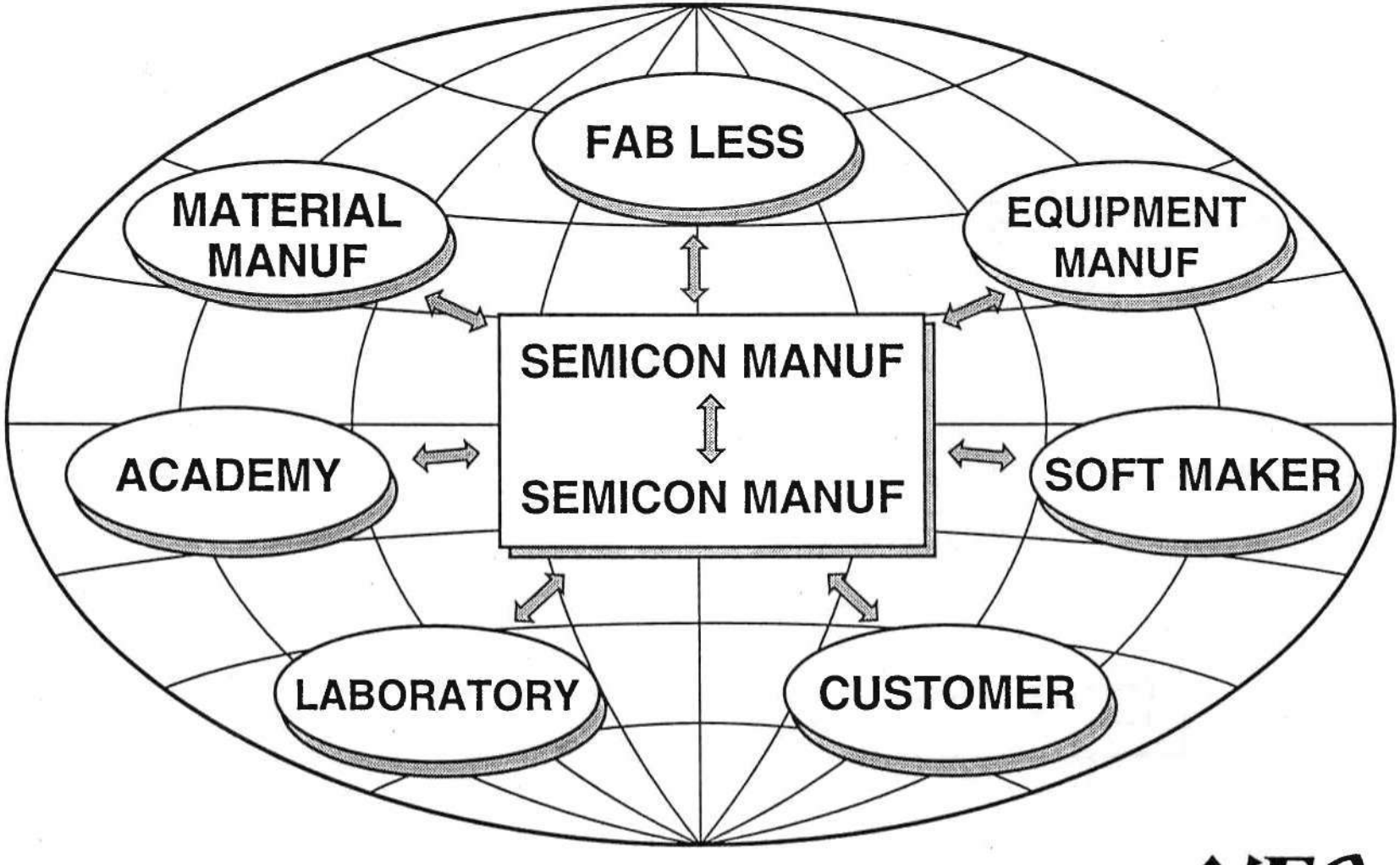
C&C COMPUTER AND COMMUNICATIONS

GLOBAL ALLIANCES



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GLOBAL ALLIANCES (EXAMPLE)

DEVELOPMENT

HITACHI	← →	TI	16MDRAM
NEC	← →	AT&T	4MSRAM
MATSUSHITA	← →	PHILIPS	VLSI for VCR

SALES

MATSUSHITA	← →	INTEL
SANYO	← →	MICRON

TECHNOLOGY

SONY	← →	AMD	SRAM
NEC	← →	ATT	CMOS PROCESS
	← →	MIPS	RISC CHIP

OEM

HITACHI	→	GOLDSTAR
MATSUSHITA	→	PHILIPS

MANUFACTURING

TOSHIBA	← →	MOTOROLA	A JOINT CONCERN
KOBE STEEL	← →	TI	A JOINT CONCERN

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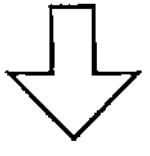
C&C COMPUTER AND COMMUNICATIONS

WORLD-WIDE OPERATION FOR THE NEXT CENTURY

MAKE A NEW STEP BY GLOBALIZATION



TOWARD AN ERA OF BORDER-LESS ECONOMY

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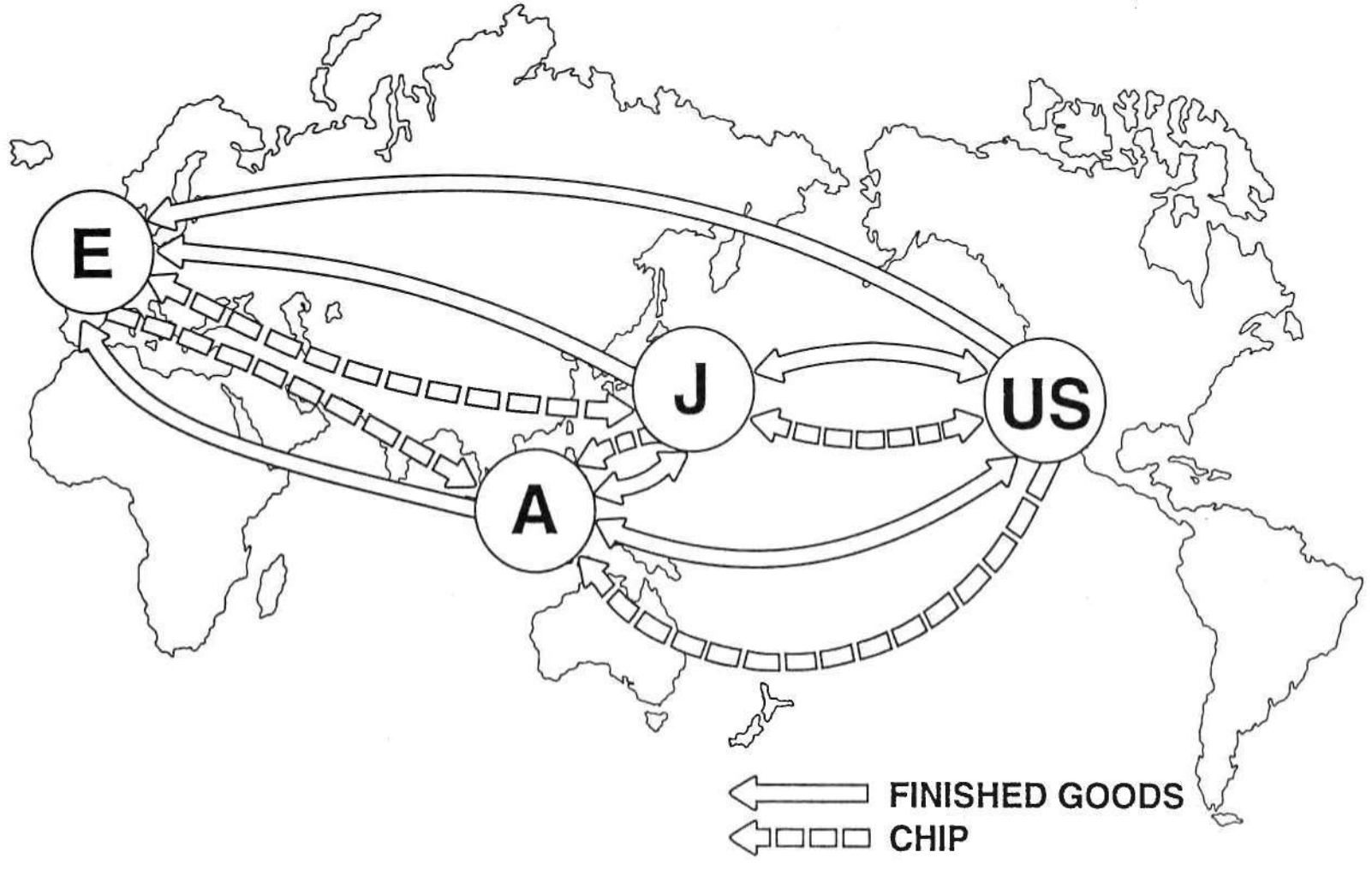
C&C COMPUTER AND COMMUNICATIONS

GLOBAL LOGISTICS (1) (SEMICONDUCTOR MANUFACTURER)



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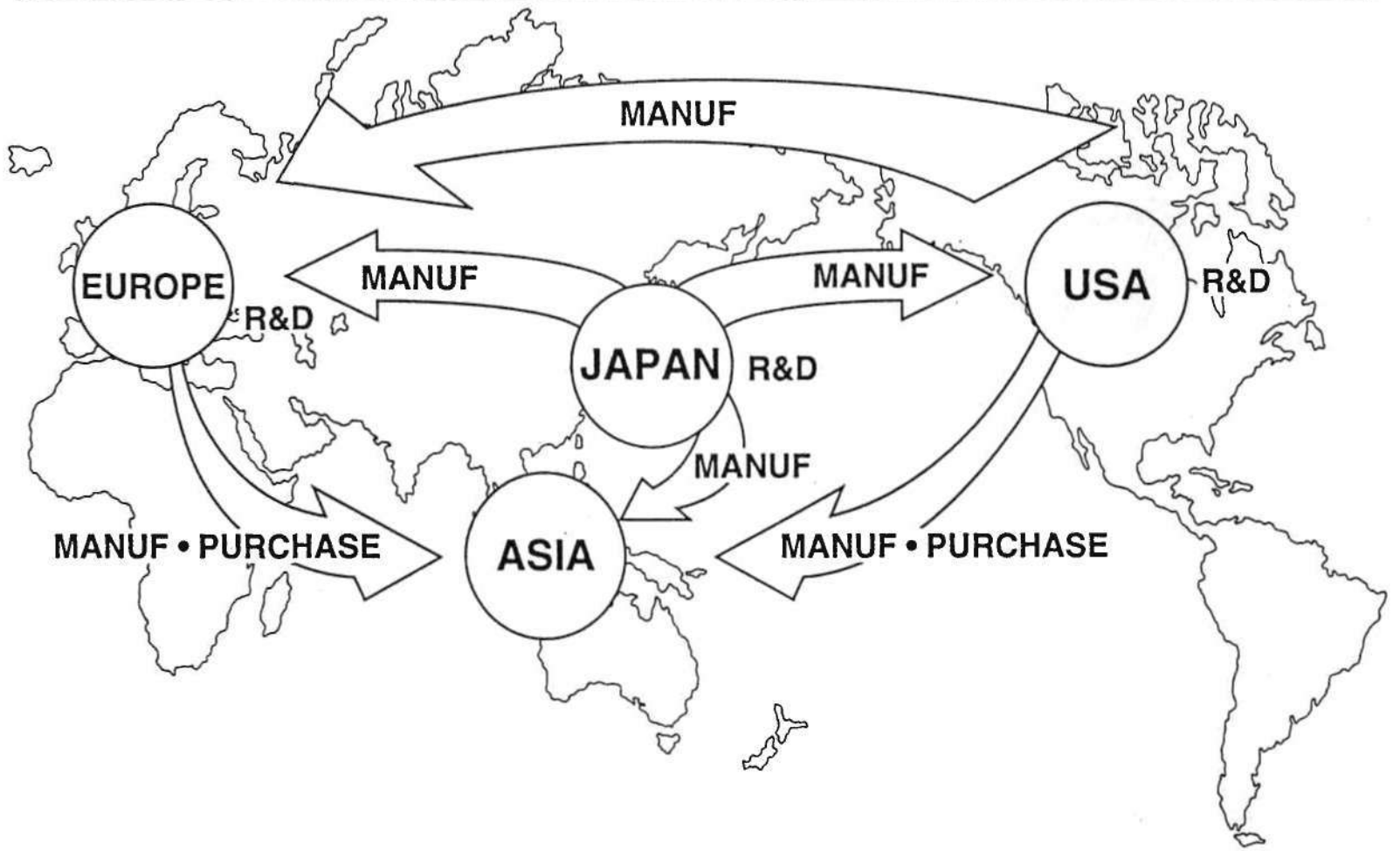
C&C COMPUTER AND COMMUNICATIONS

GLOBAL LOGISTICS (2) (ELECTRONIC EQUIPMENT MANUFACTURER)



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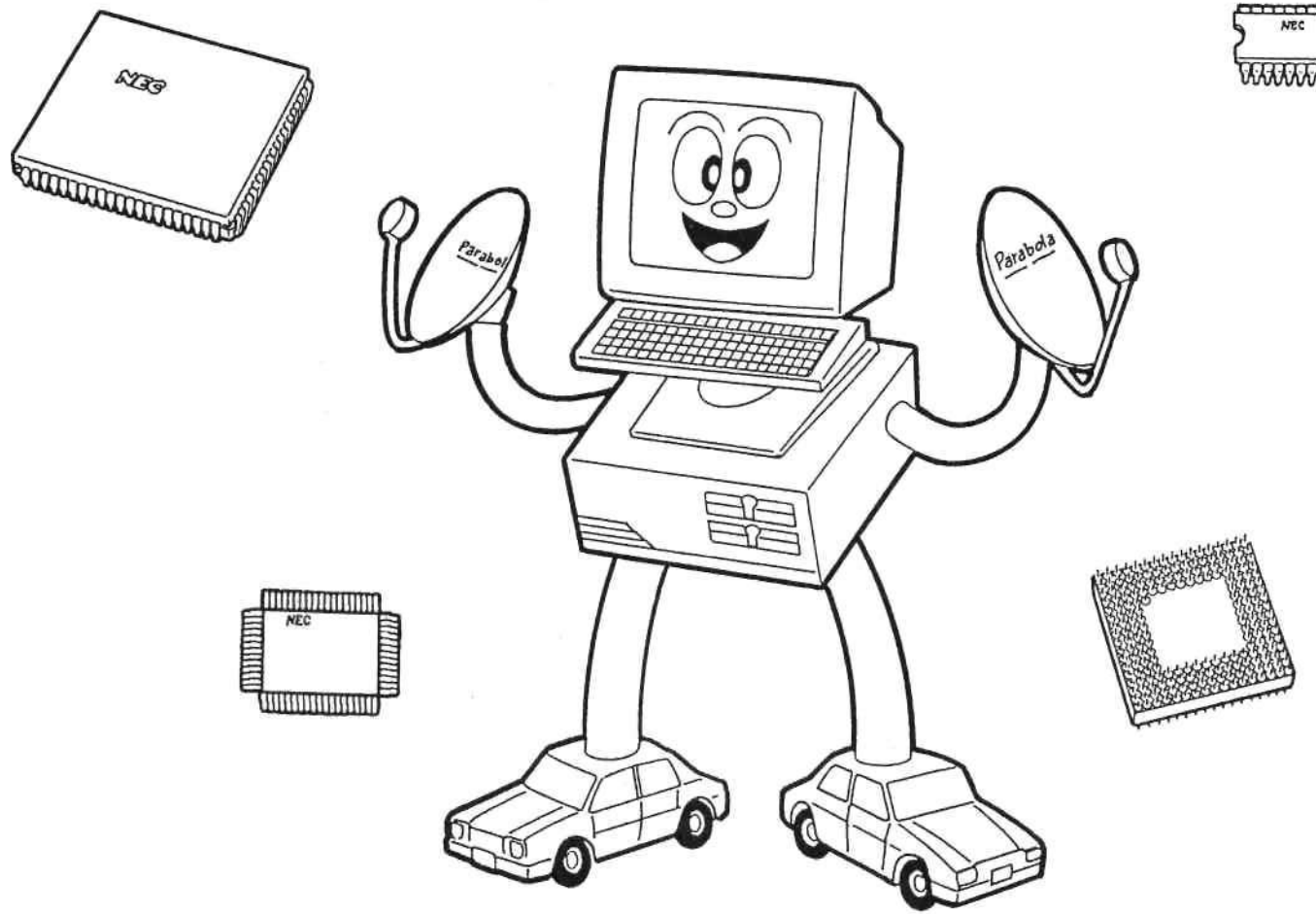

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Semiconductor Business and the Role of Alliances

Hideharu Egawa
Senior Vice President and Director of the Board
Toshiba Corporation

Mr. Egawa is Senior Vice President and Director of the Board of Toshiba Corporation, as well as Group Executive of the Semiconductor Group. Since joining Toshiba Corporation in 1955, he has held various manufacturing and management positions including Group Executive Technology of Semiconductor Group, General Manager of the Integrated Circuit Division, and Vice President and Group Executive of the Semiconductor Group. In June 1990, he was appointed to his present position. Mr. Egawa graduated from the Department of Engineering, Tokyo University.

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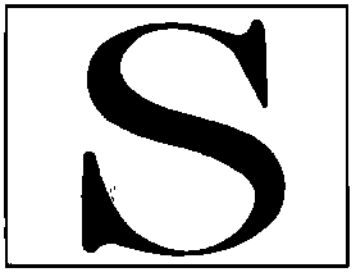


Semiconductor Business and the Role of Alliances

Hideharu Egawa
Senior Vice President and Director of the Board
Group Executive, Semiconductor Group
Toshiba Corporation

SEMICONDUCTOR BUSINESS AND THE ROLE OF ALLIANCES

Hideharu Egawa
Senior Vice President and Director of the Board
Toshiba Corporation

TOSHIBA

1. " ALLIANCE " , WHY?
   - Characteristics of Semiconductor Industry

2. " ALLIANCE " , WHAT?
   - Objectives (Independent vs. Alliances)
   - Horizontal / Vertical Alliances

3. "SUCCESSFUL ALLIANCE " , HOW?
   - Potential Problems
   - Key Factors for Success

TOSHIBA

CHARACTERISTICS OF SEMICONDUCTOR INDUSTRY

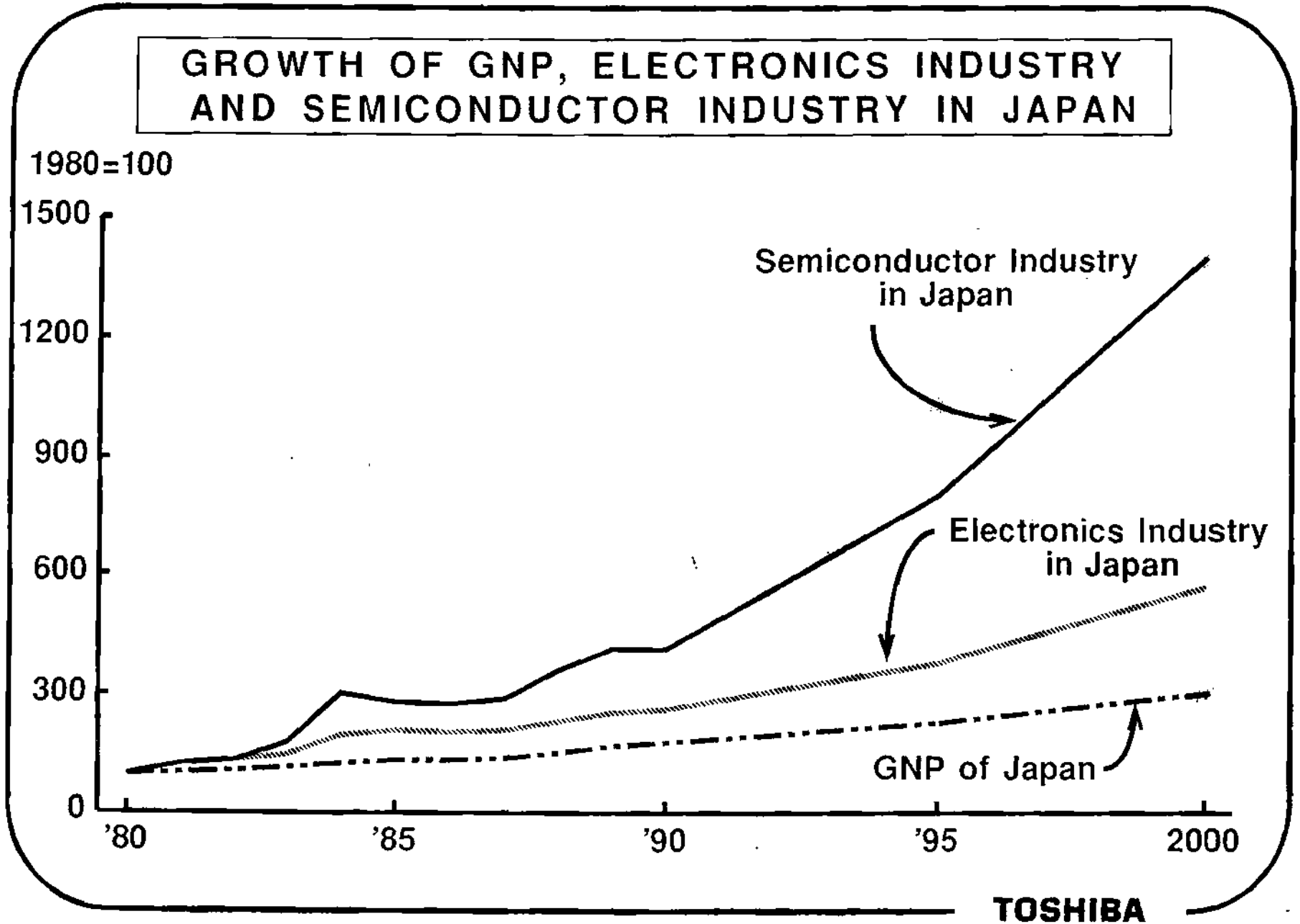
- Attractiveness for Newcomer
- Rapid Increase of Needed Resources
- Struggle for Leadership in New Standard / New Product
- International Trade Frictions

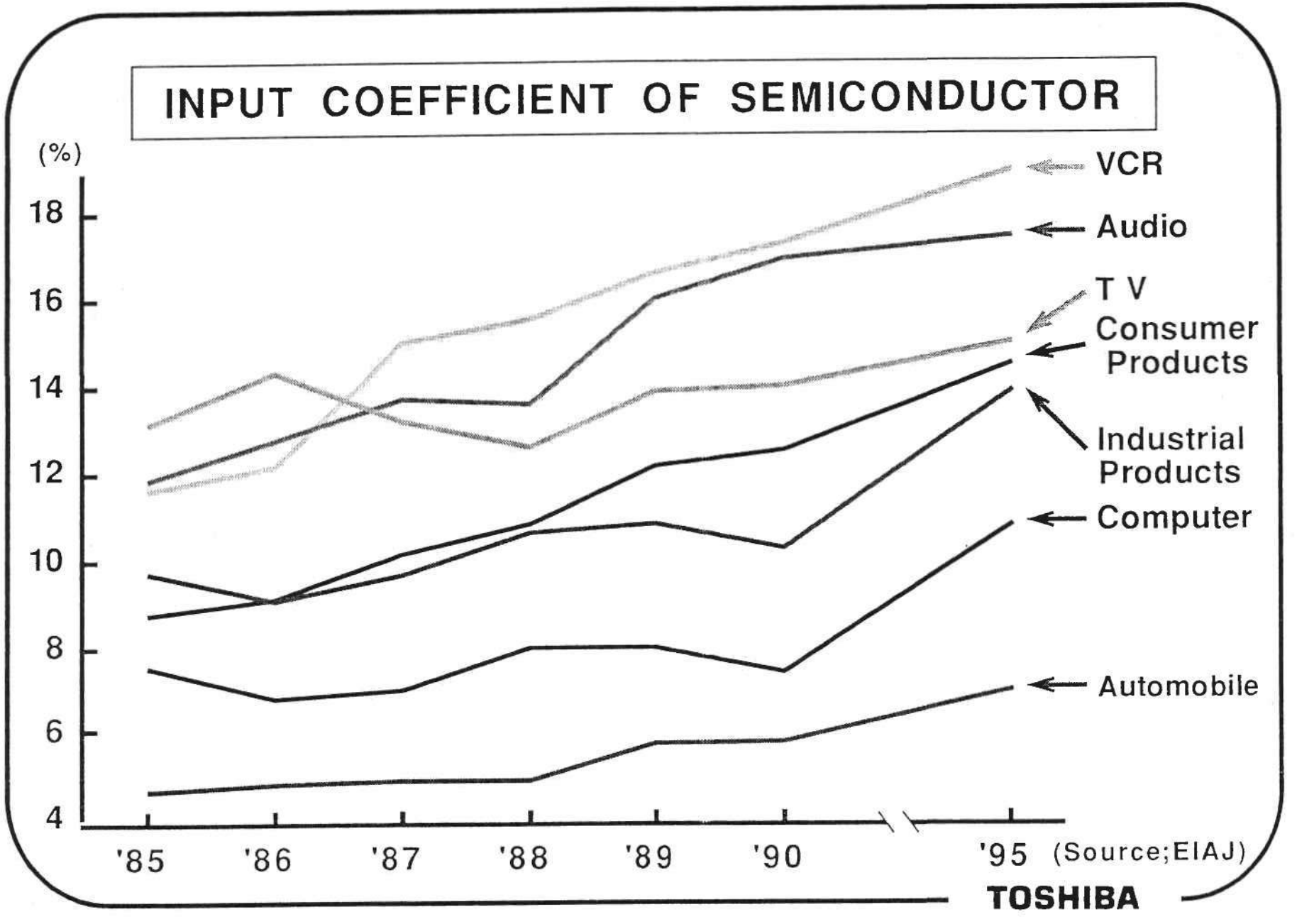
TOSHIBA

○ Attractiveness for Newcomer

- Higher Growth Rate among All Industries
- Dependence of All Industries on Semiconductor

TOSHIBA



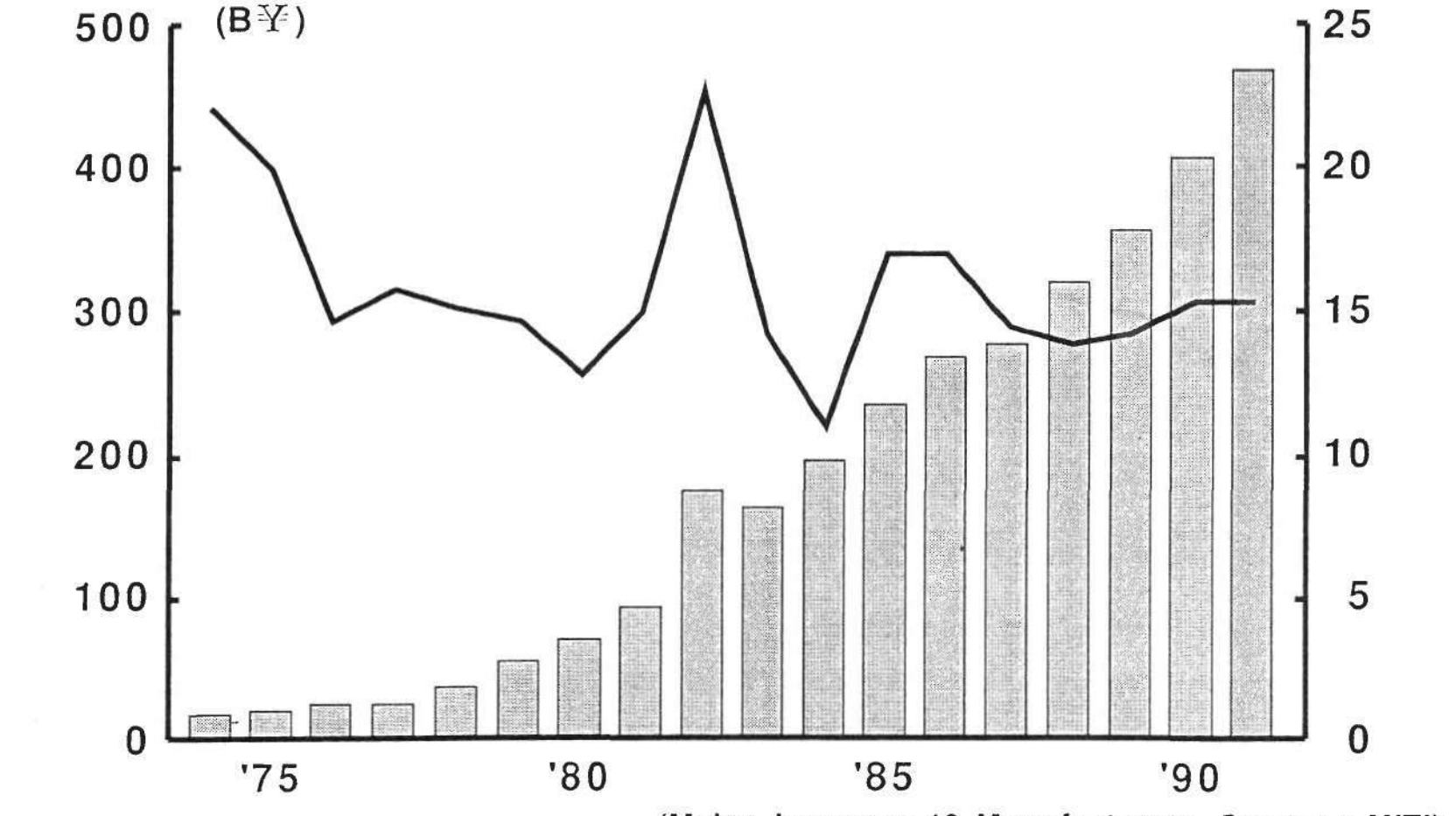


○ Rapid Increase of Needed Resources

- R&D Expenditure
- Capital Investment
- Human Resource

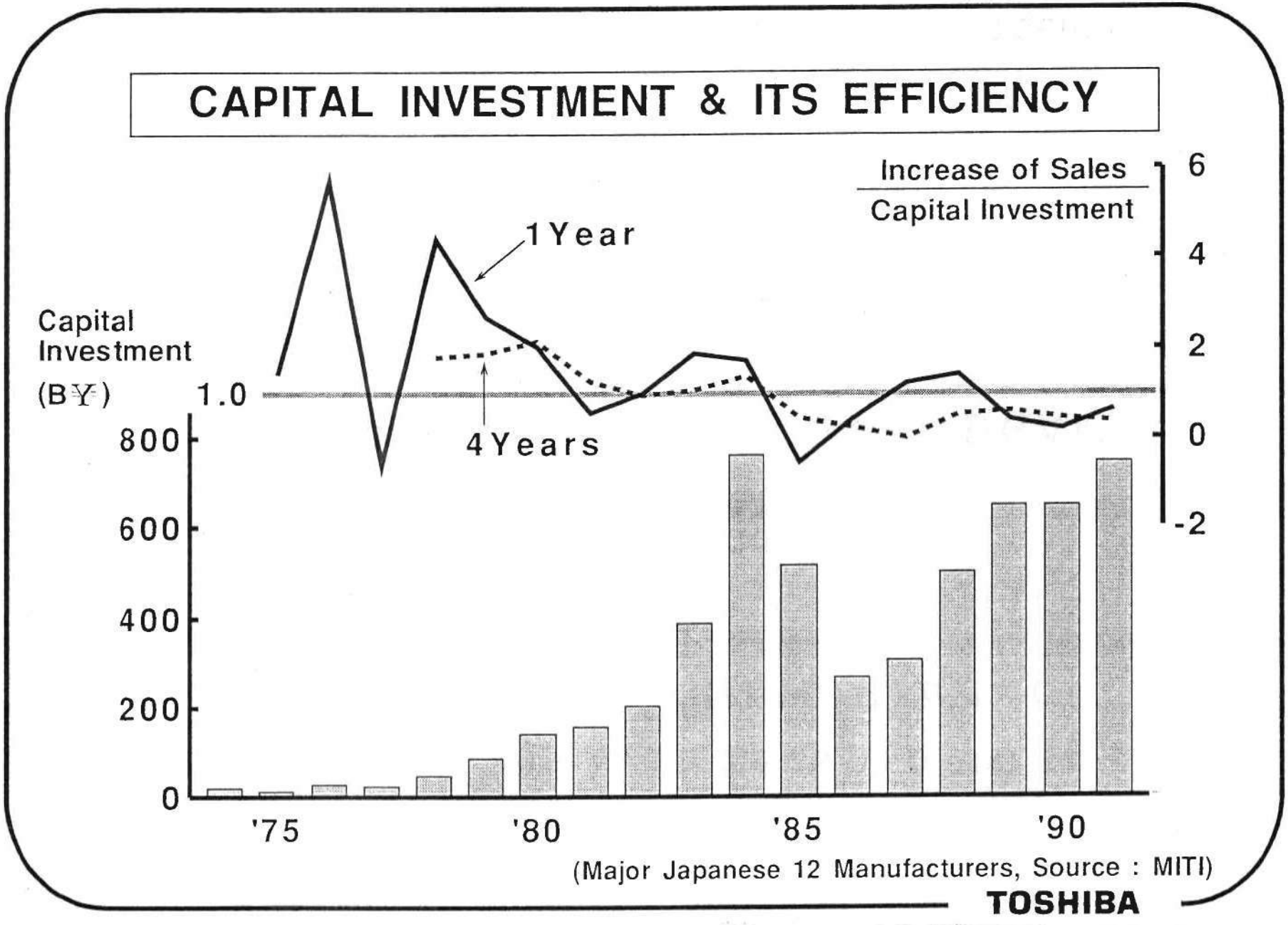
TOSHIBA

R&D EXPENDITURE AND RATIO TO SALES



(Major Japanese 12 Manufacturers, Source : MITI)

TOSHIBA



○ Straggle for Leadership in New Standard / New Product

- RISC MPU
- High Speed Data Transfer DRAM
- Flash E^2PROM

TOSHIBA

○ International Trade Frictions

- Change of Relative Position among Regions
- Trade Imbalance

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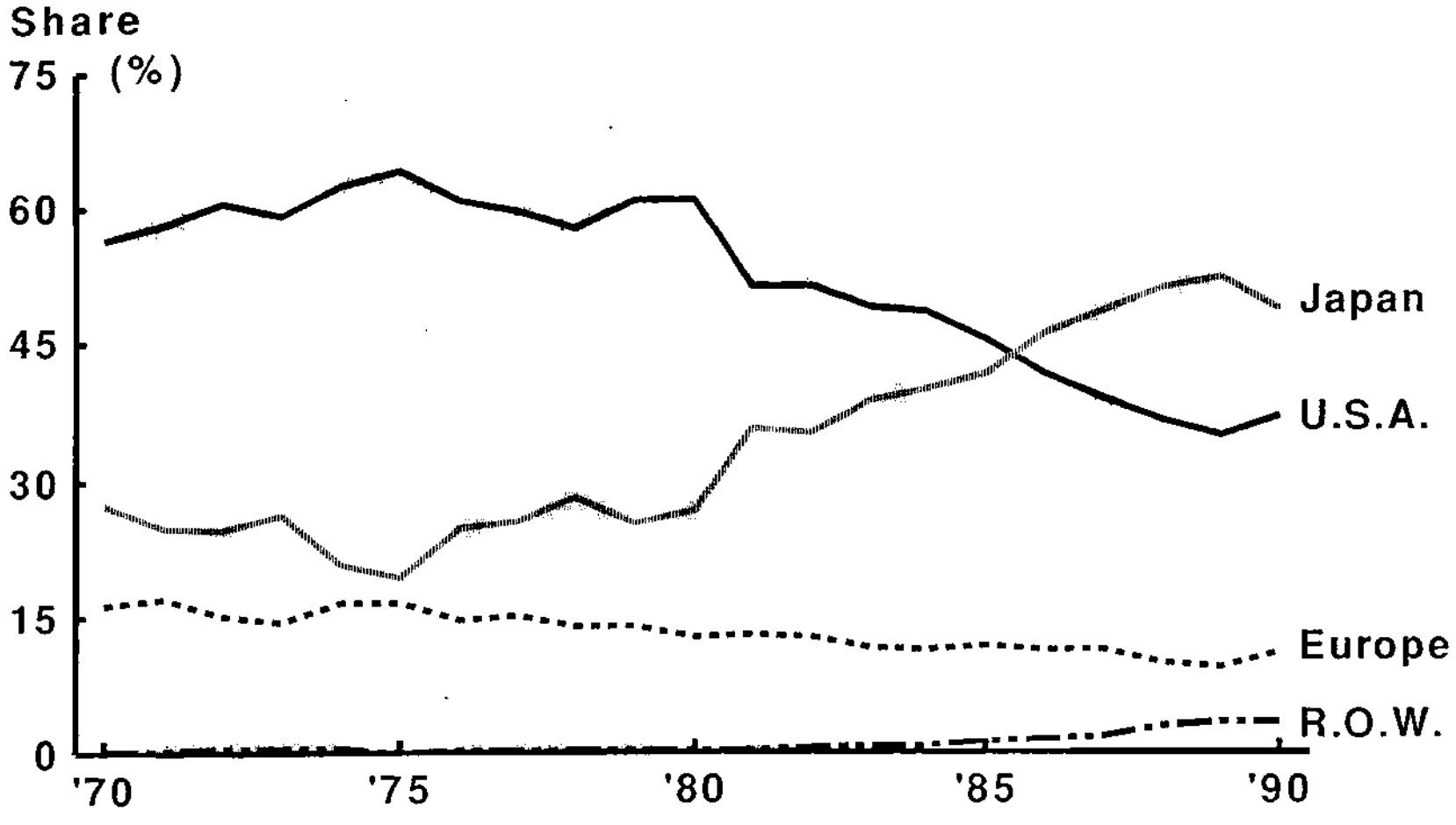
MARKET SHARE BY COMPANY NATIONALITY



(Source:Dataquest)

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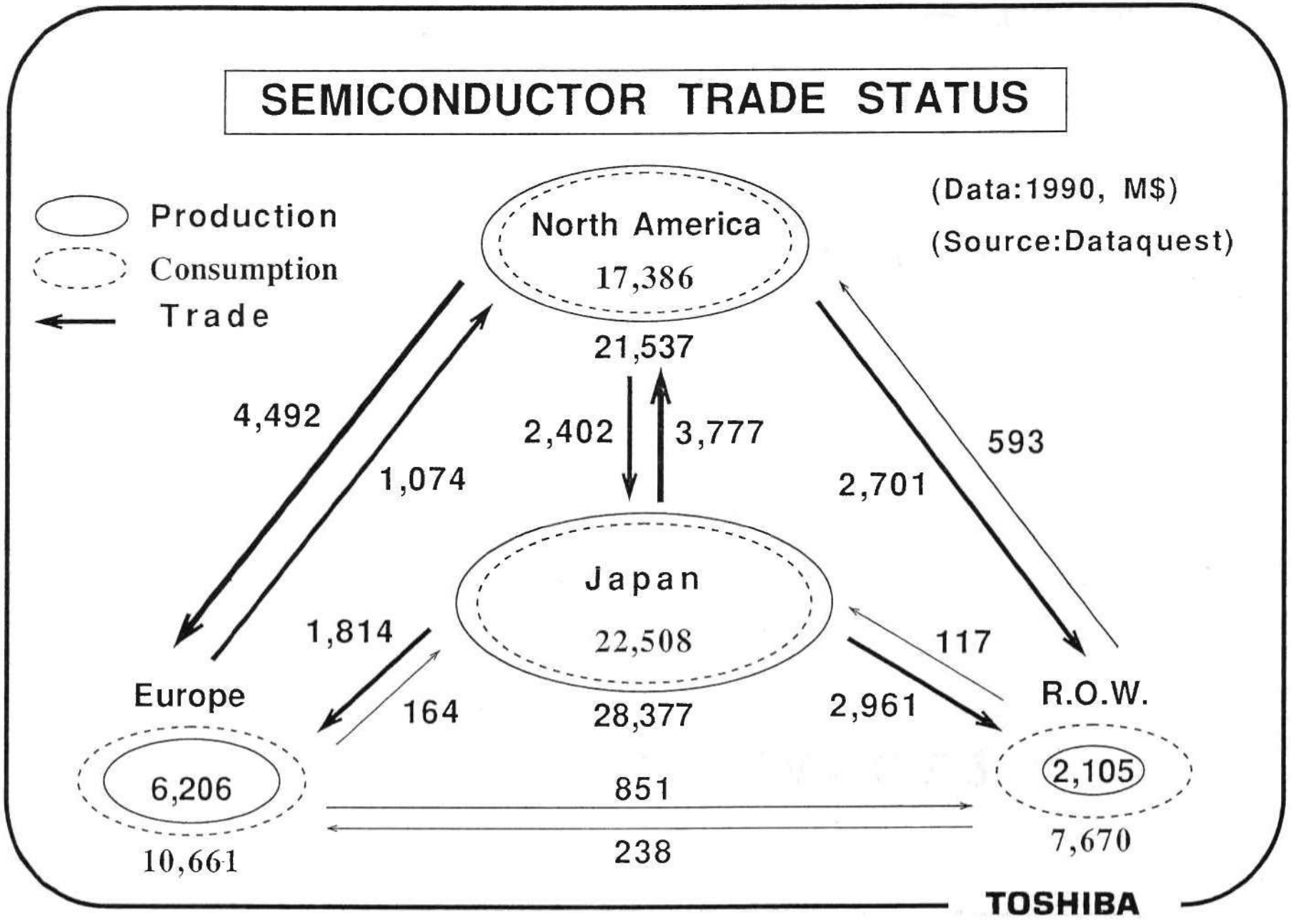


WHAT IS ALLIANCE?

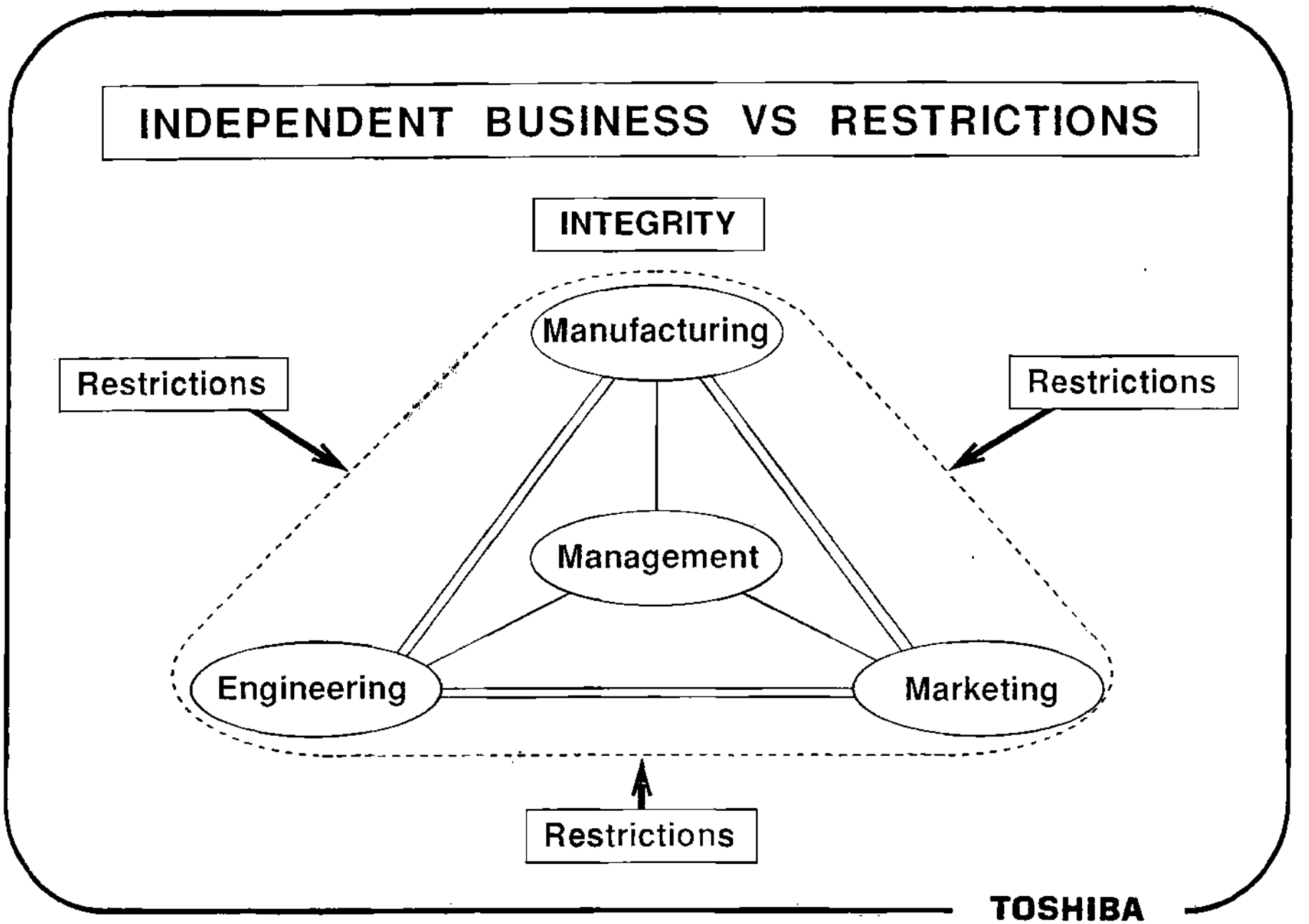
- Tools to Resolve Various Problems.
  (or to Utilize Limited Resources Worldwide in Terms of Cash , Engineers , etc.)
- Various Combinations Exist.
- Objectives Should be Different.

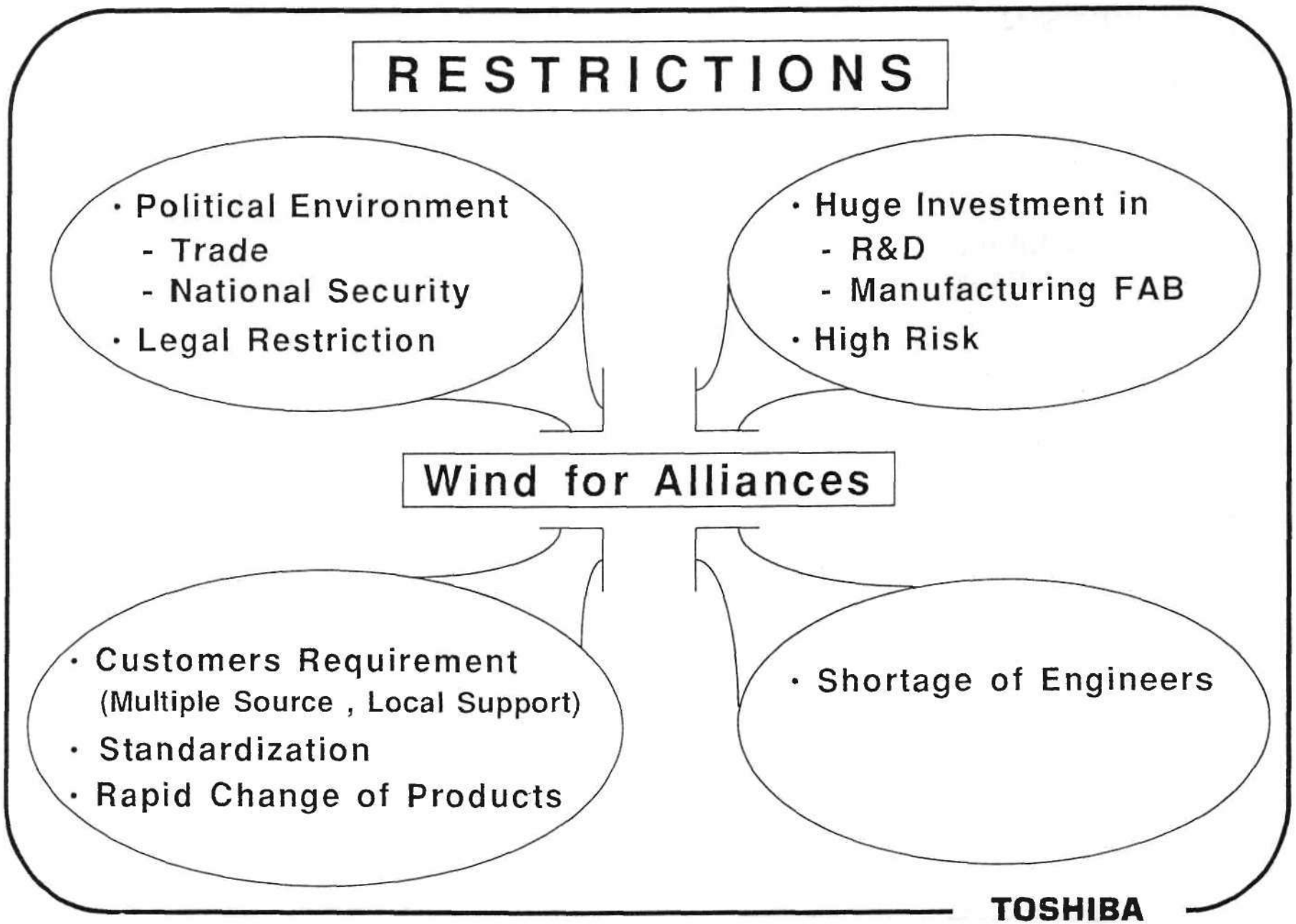
TOSHIBA

COLLABORATION WITH THIRD PARTIES FOR VARIOUS ACTIVITIES

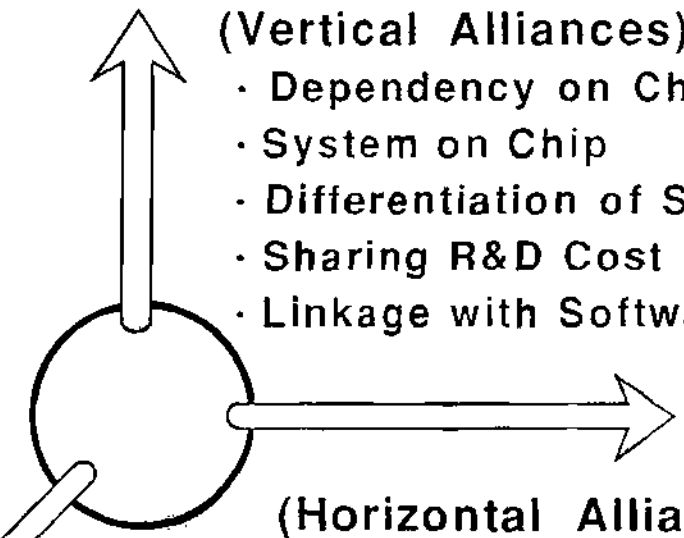
Who Performs? / Forms of Alliances	R & D	Manufacture	Sales & Marketing	Management
	Independent	Independent	Independent	Independent
	Third Party (· Subcontract · Technology Introduction)	Third Party (· Foundry)	Third Party (· Distributorship · Sales Transfer)	Third Party (· Business Transfer)
	Joint (· Joint R&D · JV)	Joint (· Shared Manufacture · JV)	Joint (· Second Sourcing · JV)	Joint (· JV)

TOSHIBA





MOTIVATIONS OF ALLIANCES



(Vertical Alliances)
- Dependency on Chip
- System on Chip
- Differentiation of System
- Sharing R&D Cost
- Linkage with Software

(Horizontal Alliance)
- Sharing Investment in R&D , Manufacture , Marketing
- Sharing Risk in Investment
- Sharing Engineering Resource
- Time to Market
- Political Environment
- Legal Restriction
- Customer Satisfaction
- Standardization

- Dependency on Equipment , Material

(Vertical Alliances)

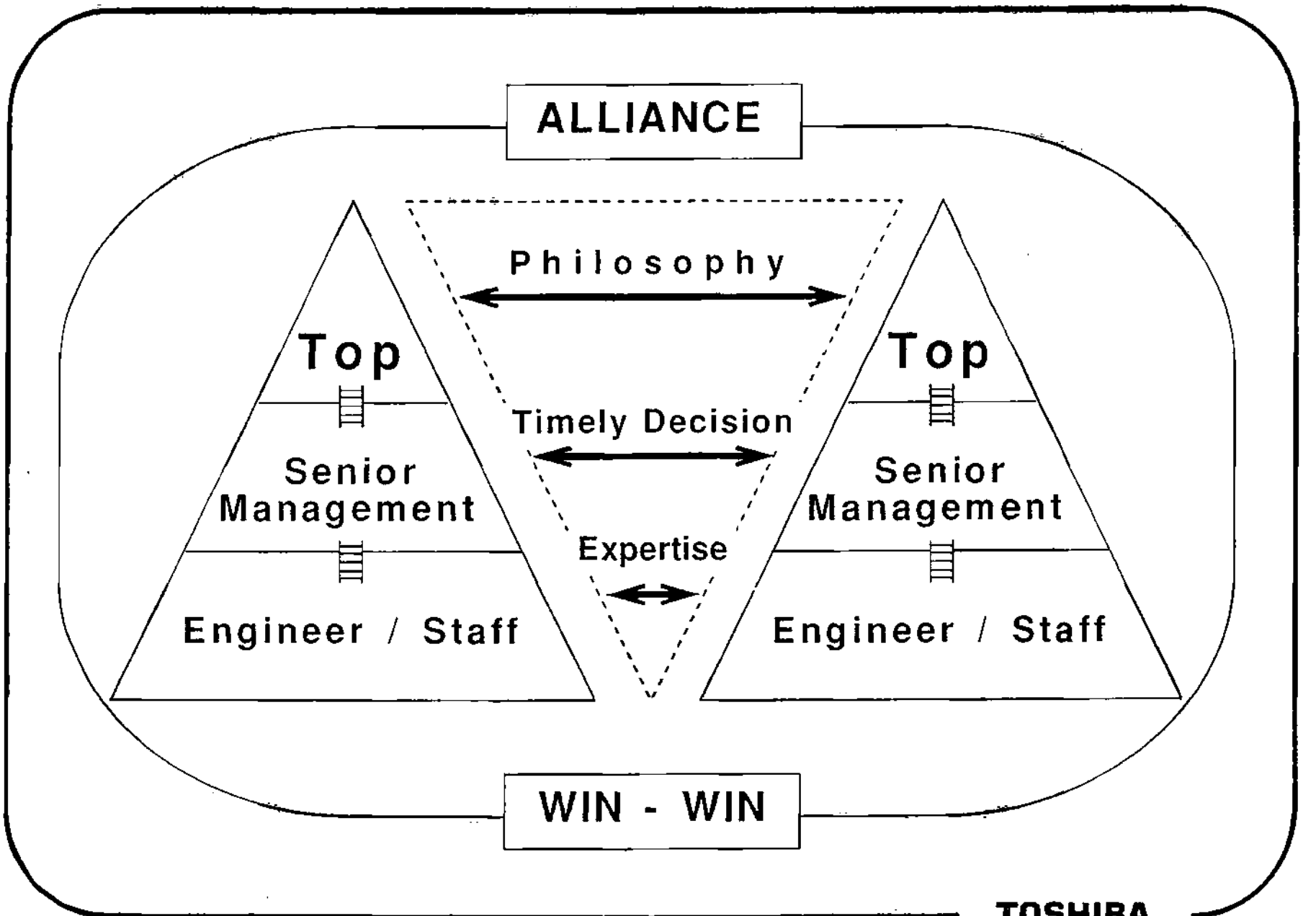
TOSHIBA

POTENTIAL MAJOR PROBLEMS OF ALLIANCES

1. Horizontal Alliances
   - (1) Competition between Partners
   - (2) Deadlock / Slow Decision
     = Failure to Make Timely Adjustment
   - (3) Anti-Trust

2. Vertical Alliances
   - (1) Competition between Partner and Other Users or Vendors
     = Cause Difficulty in Sale to Other Users or Purchase from Other Vendors
   - (2) Lose Opportunity of Access to Superior Technology / Products

TOSHIBA



OBSTACLES FOR ALLIANCES

1. Complex Issues = Timing Problem
   - Business
   - Technology
2. Rapid Change in Situation
   - Legal , Political
3. Difficulty in Quantifying Merit / Demerit

TOSHIBA

KEY FACTORS FOR SUCCESSFUL ALLIANCE

1. Philosophy
   - Ground Rule for Borderless Economy (e.g. Democracy)
   - Harmonious and Fair Competition
   - Mutual Respect
   - Effort to Minimize Trade Friction
   - Growth of Worldwide Economy
   - Win-Win = Give First

2. Timely Decision
   - Flexibility
   - Strong Leadership for Internal Coordination
   - Strong Intent for Successful Alliance

3. Expertise
   - High Skill & Knowledge

TOSHIBA

CONCLUSION

1. Alliances are Unavoidable and Desirable.

2. Easy to Establish , but Difficult to Maintain and Strengthen.

3. For Successful Alliances :

   (1) Identify Objectives , but be Flexible to Make Adjustment for Future Change in Situation.

   (2) Need " Philosophy " of Top Management (e.g. Give First).

   (3) Need Timely Decision and Strong Leadership for Coordination.

TOSHIBA

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Semiconductor Strategic Alliances with Foreign Vendors

Kazuo Kimbara
Senior Executive Managing Director and Group Executive
Electronic Devices Group
Hitachi, Ltd.

Mr. Kimbara is Senior Executive Managing Director and Group Executive of the Electronic Devices Group of Hitachi, Ltd. Since joining Hitachi in 1951, he has held various manufacturing and management positions including Manager of the Takasaki and Musashi Works, Director of the Semiconductor and Integrated Circuits Division, Board Director, Executive Managing Director, and Group Executive of the Electronic Devices Group. He was appointed to his present position in June 1991. Mr. Kimbara graduated from the department of Electrical Engineering of Nagoya University.

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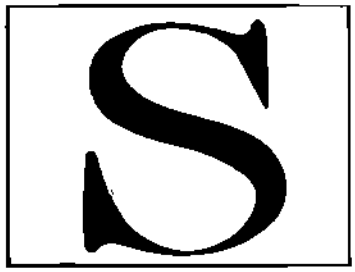


Semiconductor Strategic Alliances with Foreign Vendors

Kazuo Kimbara
Senior Executive Managing Director
and Group Executive, Electronic Devices Group
Hitachi,Ltd.

THE SEMICONDUCTOR STRATEGIC ALLIANCE WITH FOREIGN VENDORS

KAZUO KIMBARA

Senior Executive Managing Director and Group Executive
Electronic Devices Group
Hitachi, Ltd.

HITACHI

CHAPTER 1

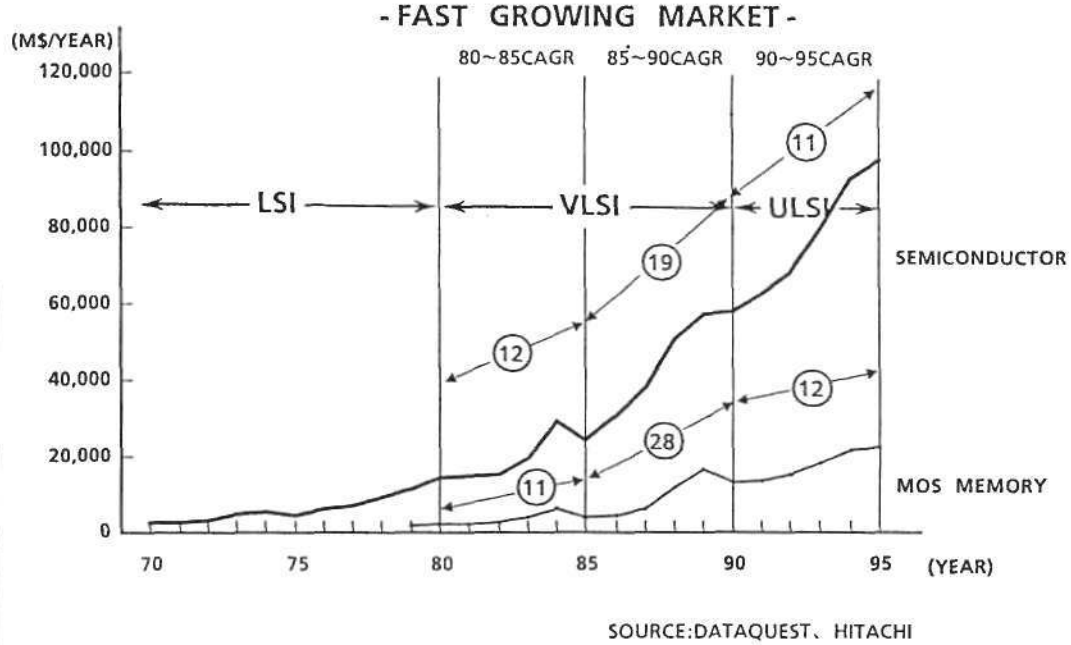
CHARACTERISTICS OF SEMICONDUCTOR INDUSTRY

- BASIC ELEMENTS OF THE ELECTRONICS INDUSTRY
- TECHNOLOGICAL INNOVATIONS & IMPROVEMENT OF PERFORMANCES
- MANUFACTURING INDUSTRY
- GLOBALIZATION

HITACHI

BASIC ELEMENTS OF ELECTRONICS INDUSTRY

- FAST GROWING MARKET -

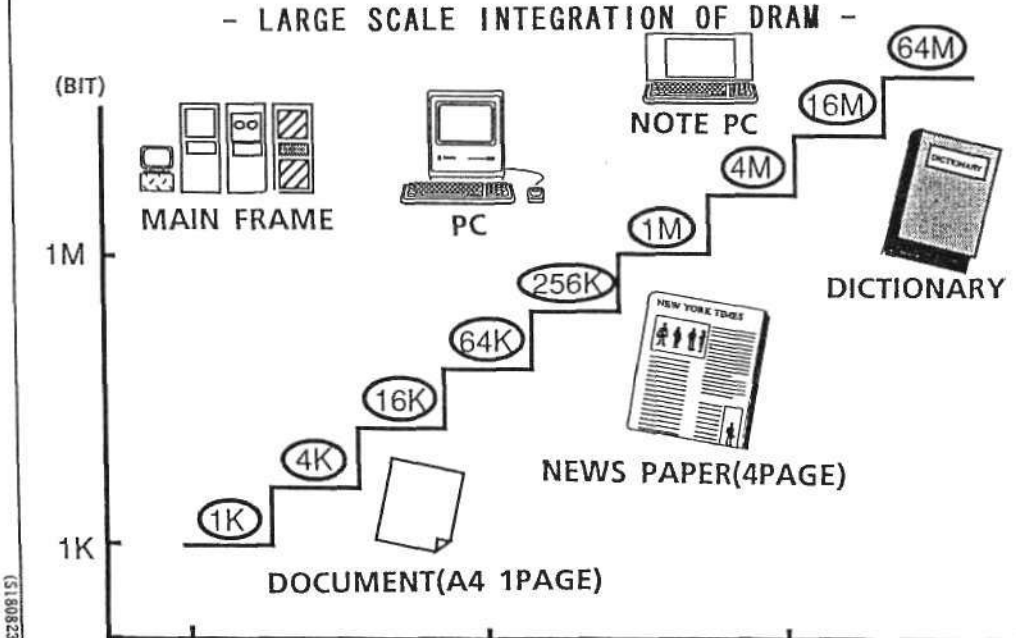


SOURCE:DATAQUEST、HITACHI

HITACHI

TECHNOLOGICAL INNOVATIONS & IMPROVEMENT OF PERFORMANCES

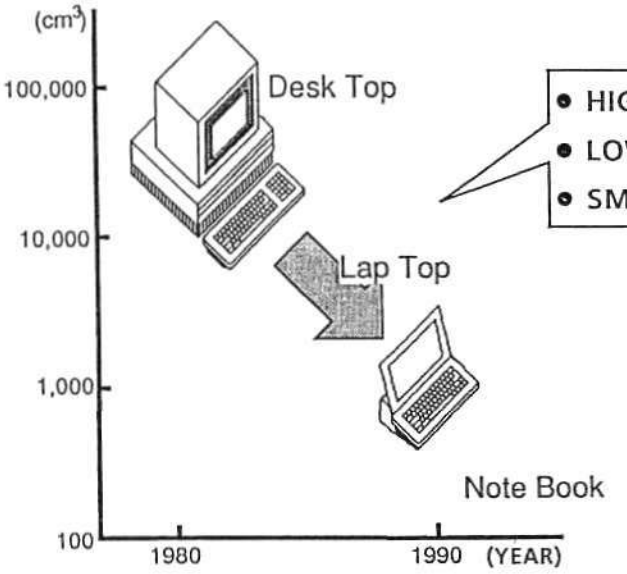
- LARGE SCALE INTEGRATION OF DRAM -



HITACHI

DIVERSIFICATION OF CUSTOMER NEEDS(1)

- PERSONAL COMPUTER -



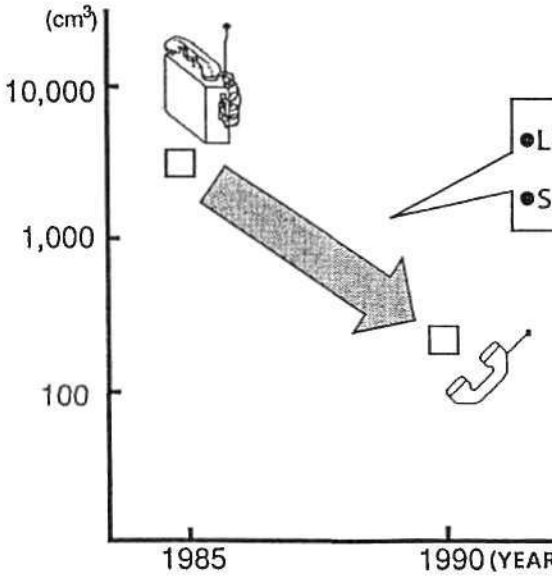
- HIGH INTEGRATION NEEDS
- LOW POWER NEEDS
- SMALL PACKAGE NEEDS

(S182023)

HITACHI

DIVERSIFICATION OF CUSTOMER NEEDS(2)

-CELLULAR PHONE-



- LOW POWER NEEDS
- SMALL PACKAGE NEEDS

(S182123)

HITACHI

MANUFACTURING INDUSTRY

- ENORMOUS INVESTMENT TO BE RECOVERED BY MASS PRODUCTION
- A HIGH-LEVEL AND COST EFFECTIVE OPERATION IS NEEDED TO ACHIEVE PROFITABILITY
- NEW PRODUCTS TO IMPROVE THE PRODUCT MIX ARE REQUIRED BECAUSE OF PRICE EROSION

HITACHI

GLOBALIZATION

- IMPORTANCE OF HIGH TECHNOLOGY INDUSTRIES
  ⇨ INTERNATIONAL TRADE FRICTION
- GLOBAL STANDARD & WORLDWIDE TRADING
  ⇨ BORDERLESS COMPANIES, GLOBAL THINKING
- GLOBAL COOPERATION & PARTNERSHIP
  ⇨ COEXISTENCE WITH COMPETITION

HITACHI

CHAPTER 2

CHALLENGES FOR SEMICONDUCTOR INDUSTRY

- STRUCTURAL CHANGES IN THE MARKET
- CEASELESS TECHNOLOGICAL INNOVATIONS
- ENORMOUS INVESTMENT IN EQUIPMENT, FACILITIES, AND R&D
- SHORTAGE OF HIGHLY SKILLED ENGINEERS
- STRATEGY FOR DEFINING PRODUCTS (HOW TO MAKE → WHAT TO MAKE)
- COOPERATION AND COMPETITION

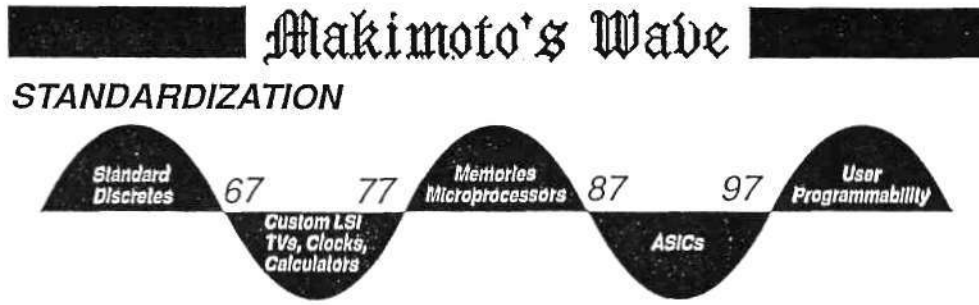
(S180623)

HITACHI

STRUCTURAL CHANGES IN THE MARKET

- STANDARDIZATION VS CUSTOMIZATION
- USER FRIENDLY TRENDS IN DIVERSIFICATION OF NEEDS

Makimoto's Wave



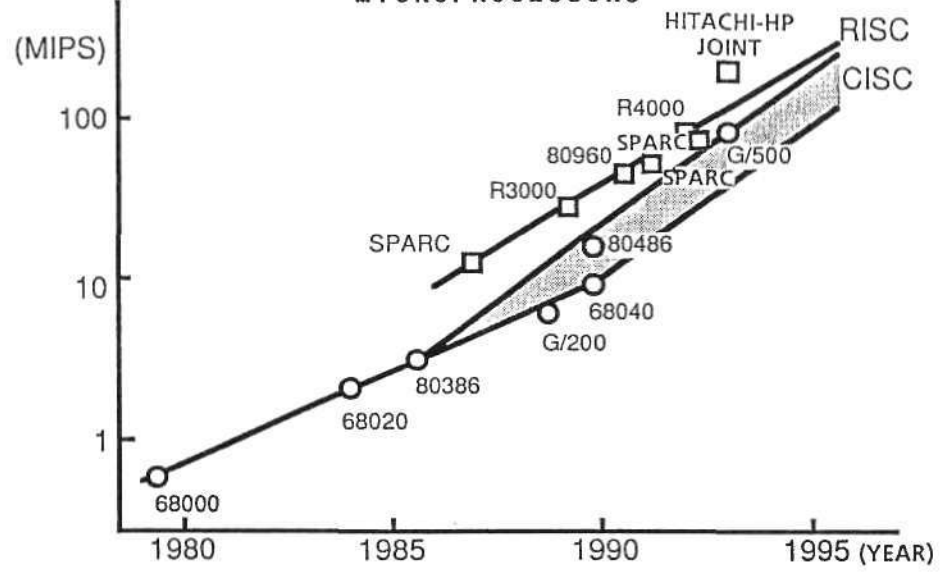
(Source: David Manners/ Electronics Weekly)

STANDRADIZED IN MANUFACTURING → *CUSTOMIZED IN APPLICATION*

(S180723)

HITACHI

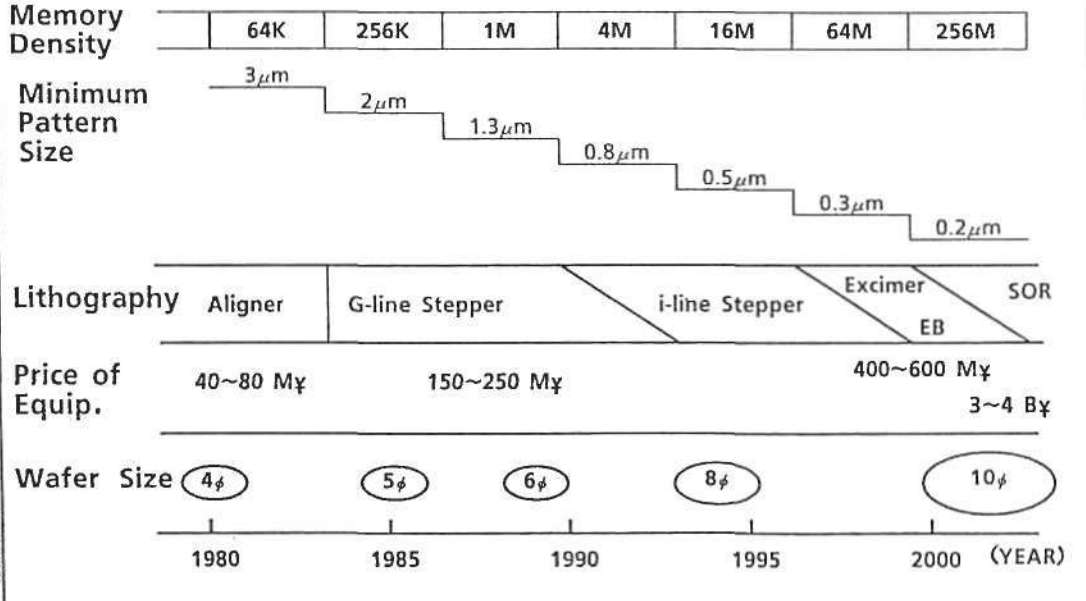
HIGHLY FUNCTIONAL & VALUE-ADDED PRODUCTS
(DESIGN RICH PRODUCTS)
- MICROPROCESSORS -



(S180523)

HITACHI

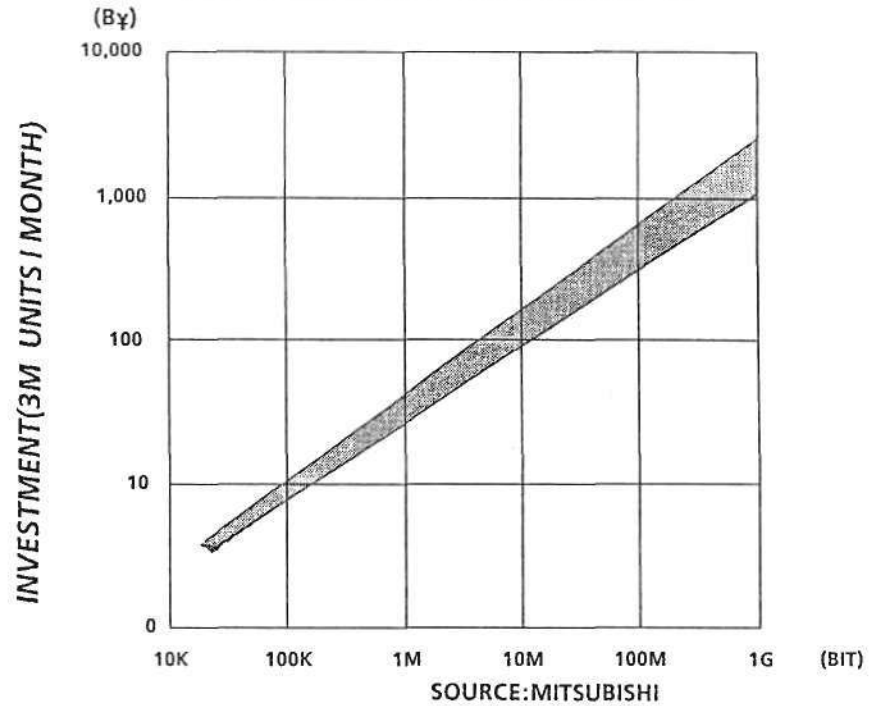
CEASELESS TECHNOLOGICAL INNOVATIONS
- FINE PATTERN & LARGE SCALE INTEGRATION -



(S182023)

HITACHI

ENORMOUS INVESTMENT



(S182023)

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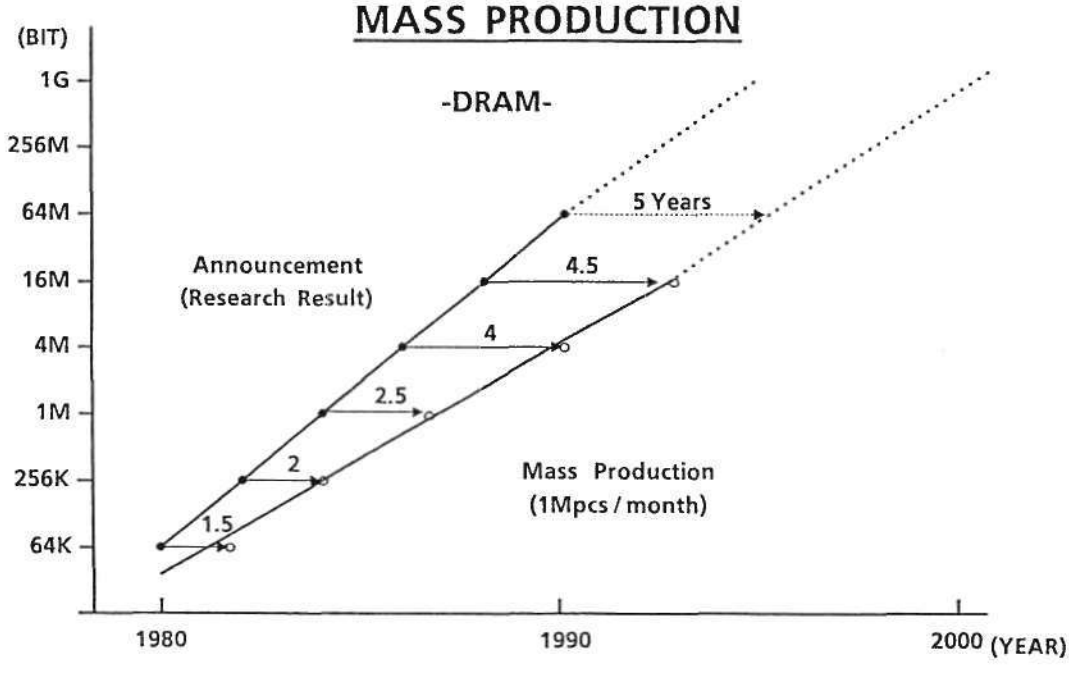
INCREASING R&D REQUIRES LONGER TIME UNTIL MASS PRODUCTION



(S182023)

HITACHI

SHORTAGE OF HIGHLY SKILLED ENGINEERS

- REQUIRING ADVANCED TECHNOLOGY SKILLS
- REQUIRING ADVANCED SOFTWARE DEVELOPMENT
- LIMITED SOURCE OF ENGINEERS' SUPPLY AND REQUIRING TIME FOR THE TRAINING

HITACHI

STRATEGY FOR DEFINING PRODUCTS
(HOW TO MAKE → WHAT TO MAKE)

- HIGH VOLUME SMALL VARIETY PRODUCTION
  ⇨ LOW VOLUME LARGE VARIETY PRODUCTION
- COMMODITIES ⇨ DESIGN RICH PRODUCTS
- MEETING CUSTOMER NEEDS IN A TIMELY MANNER

HITACHI

COOPERATION AND COMPETITION

- MARKET SHARE
  ⇨ COEXISTENCE WITH COMPETITION

- EXPORT ORIENTED
  ⇨ INCREASE OF LOCAL PRODUCTION

- INDEPENDENT ACTIVITIES THROUGH ALL PROCESS
  ⇨ PARTNERSHIP AND ALLIANCE

HITACHI

CHAPTER 3

CHANGES IN SEMICONDUCTOR MANUFACTURERS' STRATEGIES

- ENORMOUS INVESTMENT & LIMITED RESOURCES
  ⇨ ALLIANCE WITH SEMICONDUCTOR VENDORS

- MEETING CUSTOMER NEEDS
  ⇨ ALLIANCE WITH CUSTOMERS

- REALIZING HIGH TECHNOLOGICAL DEVELOPMENT
  ⇨ ALLIANCE WITH EQUIPMENT VENDORS

- GLOBAL PARTNERSHIP
  ⇨ ALLIANCE WITH OVERSEAS COMPANIES

HITACHI

ALLIANCE WITH SEMICONDUCTOR VENDORS

- TECHNOLOGY COOPERATION
- JOINT DEVELOPMENT
- JOINT VENTURES FOR PRODUCTION OR DEVELOPMENT
- SECOND SOURCE AND/OR OEM BUSINESS
- FOUNDRY BUSINESS
- RESOURCE SHARING
- R&D COST/RISK SHARING

HITACHI

ALLIANCE WITH CUSTOMERS

- QUICK ACCESS TO CUSTOMER NEEDS
- DEVELOPMENT OF APPLICATION-SPECIFIC FUNCTION
- SHORTER R&D PERIOD

HITACHI

ALLIANCE WITH EQUIPMENT VENDORS

- EXPLORE NEW TECHNOLOGICAL INNOVATIONS
- GUARANTEE SOURCE OF EQUIPMENT SUPPLY
- REDUCE THE RISK AND TIME FOR THE DEVELOPMENT OF THE EQUIPMENT

HITACHI

CHAPTER4

HITACHI'S STRATEGIC ALLIANCES (WITH SEMICONDUCTOR VENDORS)

- HITACHI/TI : JOINT DEVELOPMENT OF 64MDRAM
- HITACHI/VLSI TECHNOLOGY : ASIC COOPERATION
- HITACHI/GOLDSTAR ELECTRON : 4MDRAM COOPERATION

HITACHI

OBJECTIVES OF HITACHI/TI JOINT DEVELOPMENT OF 64MDRAM

- REDUCE THE DEVELOPMENT TIME, COST, AND MANPOWER
- SHARE THE BURDEN OF INVESTMENT IN FACILITIES
- ESTABLISH A LONG-TERM COOPERATIVE RELATIONSHIP

(S18823)

HITACHI

DETAILS OF HITACHI/TI JOINT DEVELOPMENT

- DESIGN (JOINT DESIGN WORK UNDER JOINT MANAGEMENT)
- PROCESS (0.35μm COMMON PROCESS TECHNOLOGY)
- DESIGN AUTOMATION (COMMON DESIGN AUTOMATION ENVIRONMENT)
- PACKAGE (COMMON PACKAGE)
- RELIABILITY (COMMON EVALUATION TECHNOLOGY)
- PRODUCTION (EXCHANGE OF MANUFACTURING INFORMATION)

(S18824)

HITACHI

HITACHI / VLSI TECHNOLOGY : ASIC COOPERATION

OBJECTIVE: •COMPLEMENTARY ACTIVITIES TO EXCHANGE LEADING-EDGE TECHNOLOGIES TO EACH OTHER

DETAILS: •CMOS PROCESS TECHNOLOGIES (HITACHI → VLSI)
•DESIGN SOFTWARE OF ASIC (VLSI → HITACHI)

RESULTS: •CODEVELOPMENT OF 0.8μm ASIC CELL
•MUTUAL MARKETING OF THE ASIC

HITACHI

HITACHI/GOLDSTAR ELECTRON : 4MDRAM COOPERATION

OBJECTIVES: •LOWER INVESTMENT COST
•ESTABLISH RELATIONSHIP WITH KOREAN MANUFACTURER

DETAILS : •TECHNOLOGY TRANSFER OF 1MDRAM/4MDRAM
•OEM PURCHASING FROM GOLDSTAR ELECTRON

HITACHI

THE WAYS TO SUCCESS IN AN ALLIANCE

1. CLEAR OBJECTIVE
2. COMMON TECHNOLOGY
3. ORGANIZED MANAGEMENT STRUCTURE
4. GOOD COMMUNICATION
5. LONG-TERM RELATIONSHIP
6. COMPLEMENTARY ACTIVITIES
7. FAIR SHARE OF COSTS & BENEFITS

HITACHI

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Semiconductor Strategies in the European Semiconductor Industry

Takashi Kitaoka
Executive Vice President and Director of the Board
Mitsubishi Electric Corporation

Mr. Kitaoka is Executive Vice President of Mitsubishi Electric Corporation (MELCO) and is responsible for MELCO's Electronic Devices Group. Mr. Kitaoka joined MELCO in 1955 and has held various manufacturing and management positions including Manager of the Kita-Itami Works (semiconductor), and Manager of the Inazawa Works (elevators). He was appointed to his present position in June 1991. Mr. Kitaoka graduated from Kyoto University and holds a master's degree in Electrical Engineering.

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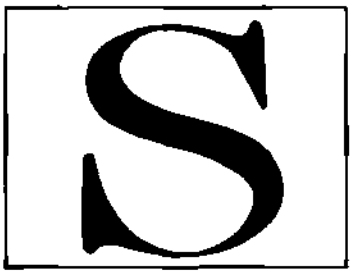
JAPANESE SEMICONDUCTOR INDUSTRY CONFERENCE
April 13-14, 1992
Tokyo, Japan



Semiconductor Strategies in the European Semiconductor Industry

Takashi Kitaoka
Executive Vice President and Director of the Board
Mitsubishi Electric Corporation

THIS PRESENTATION WAS NOT AVAILABLE AT

TIME OF PUBLICATION

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Consumer Electronics Market and Alliances

Tatsuo Kawasaki
Senior Managing Director, Business Group-1
Matsushita Electronics Corporation

Dr. Kawasaki is Senior Managing Director in charge of Business Group-1 (Semiconductor Sector) of Matsushita Electronics Corporation. After joining Matsushita Electric Industrial Co., Ltd. in 1964, Dr. Kawasaki was transferred to Matsushita Electronics Corporation to work in semiconductor development. In 1981, he was promoted to Acting Director of the VLSI Division. In 1986, Dr. Kawasaki was appointed to the board of directors of Matsushita Electronics Corporation and named Director of LSI Division-1. He has been in his present position, with responsibility for managing all activities in the semiconductor business, since 1991. Dr. Kawasaki received B.E., M.E., and Ph.D. degrees from Kyoto University.

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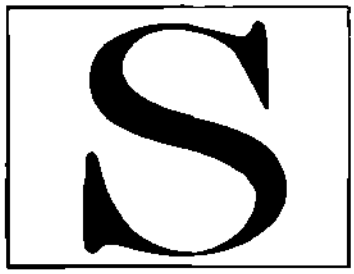


Consumer Electronics Market and Alliances

Tatsuo Kawasaki
Senior Managing Director, Business Group-1
Matsushita Electronics Corporation

Consumer Electronics Market and Alliances

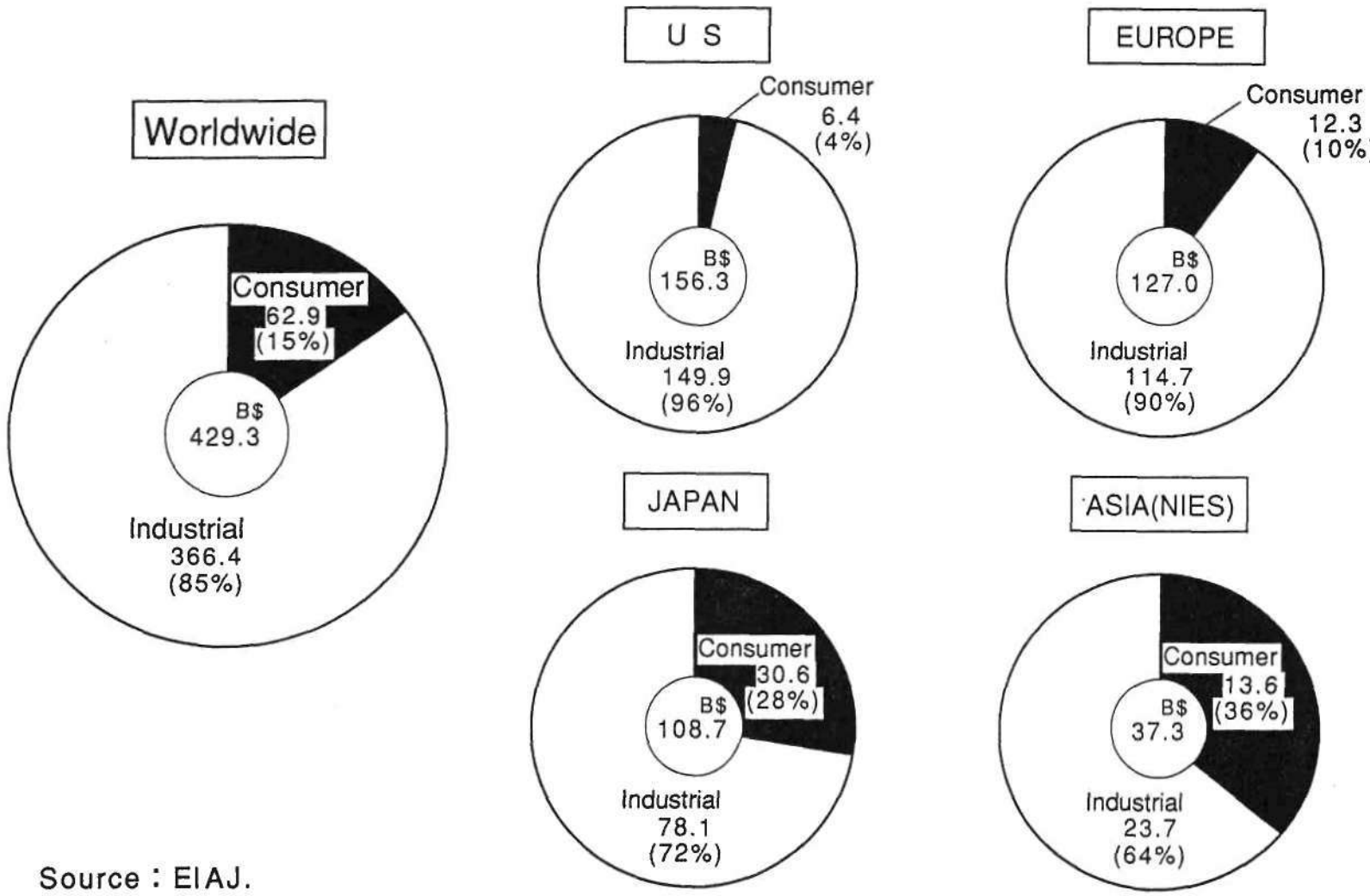
April 13 , 1992

Tatsuo Kawasaki
Senior Managing Director
Matsushita Electronics Corporation

Panasonic

Worldwide Electronics Equipment Production (1990)

(Billions of Dollars)

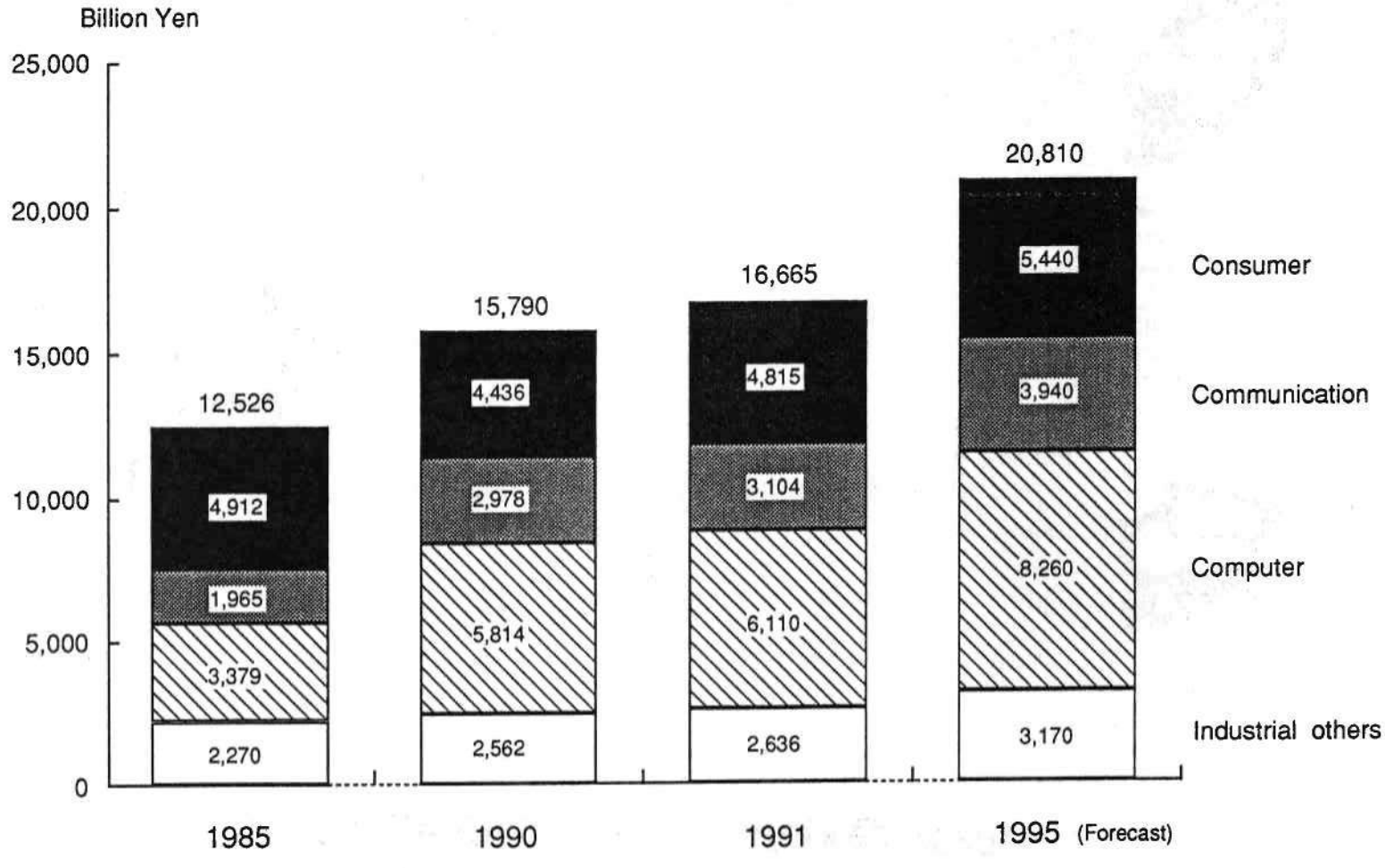


Source : EIAJ.

Panasonic

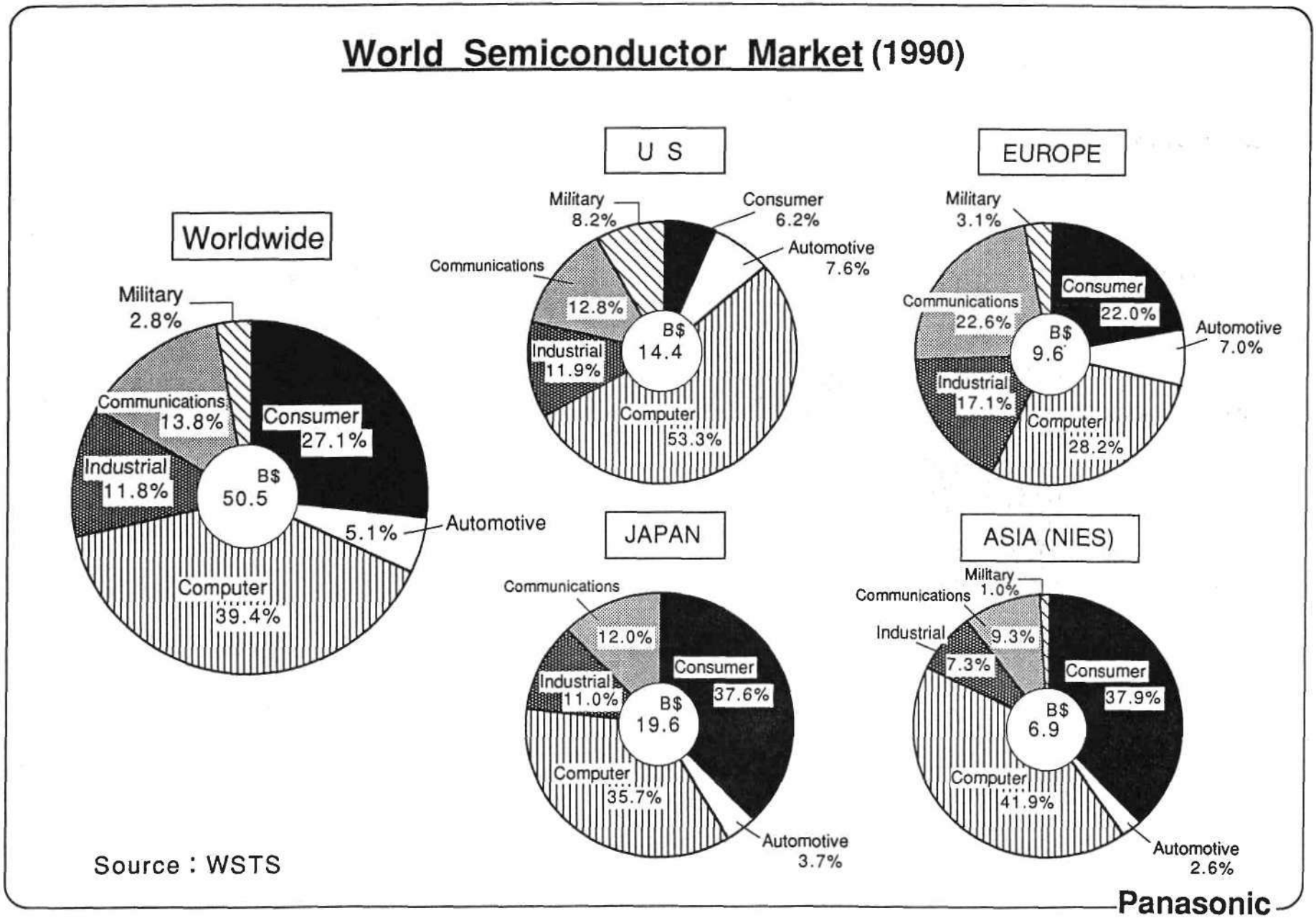
Electronics Equipment Market

—JAPAN—

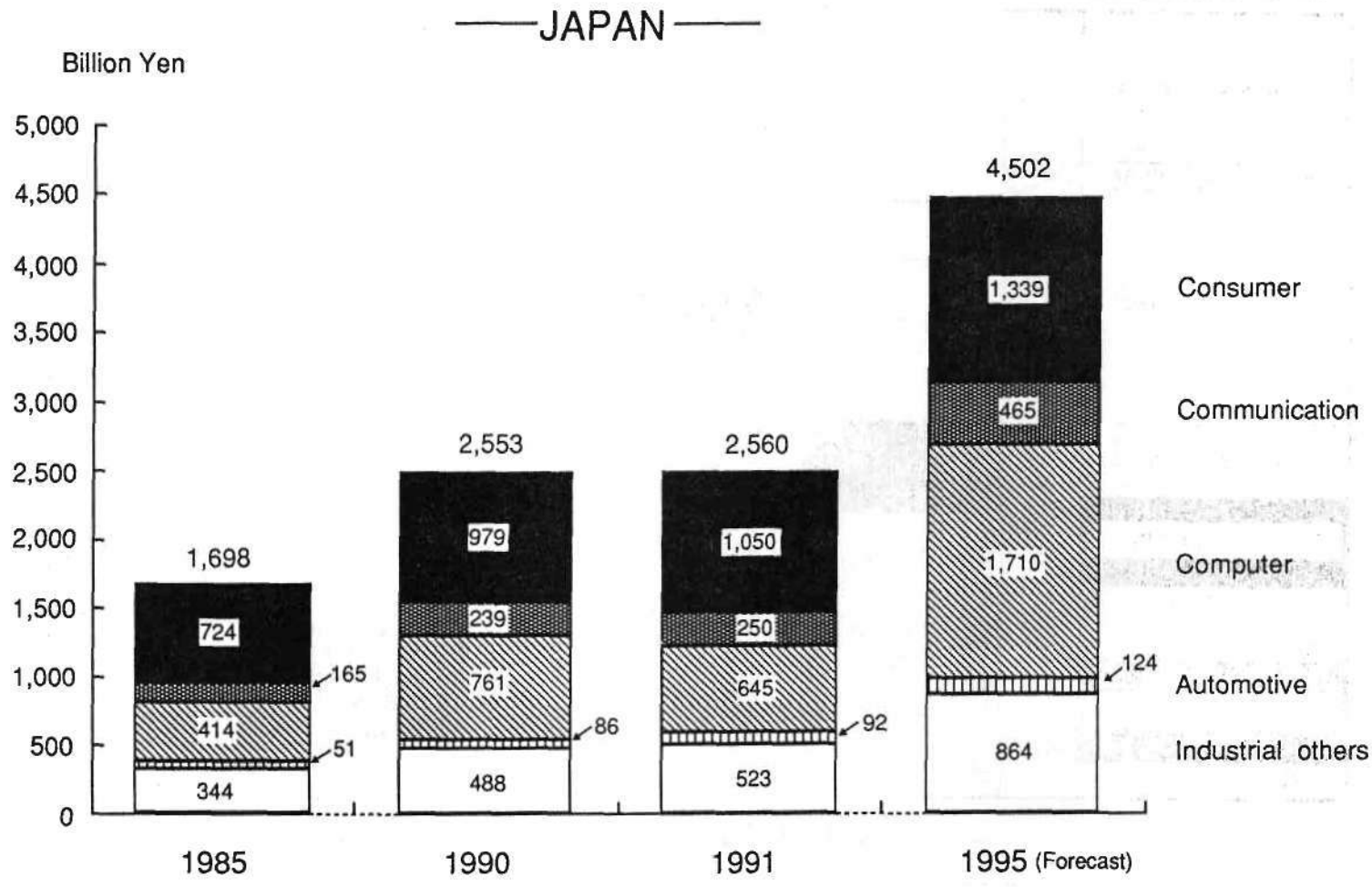


Source : EJAJ

Panasonic



Semiconductor Demand By Market

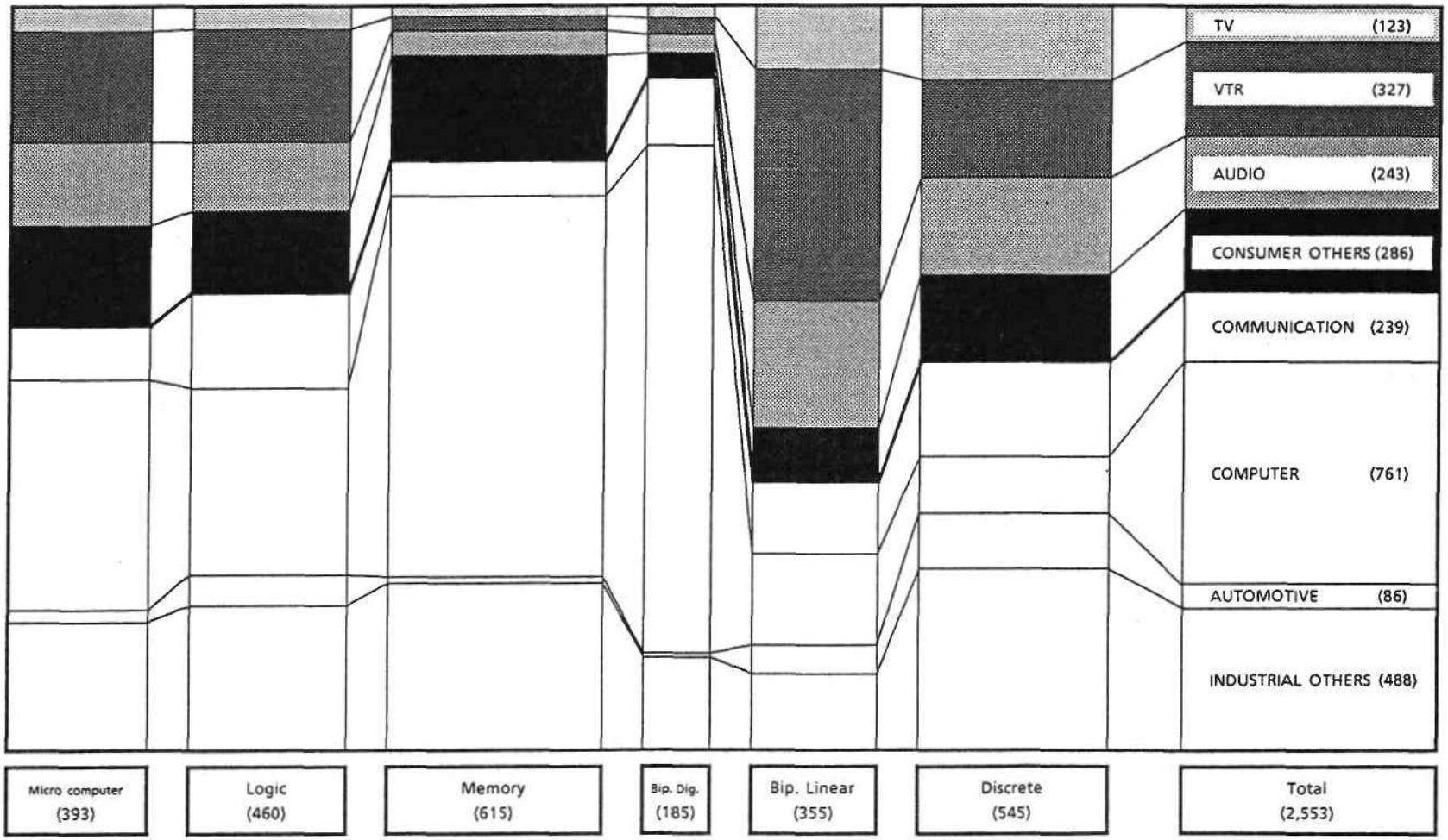


Source : EJAJ

Panasonic

Semiconductor Demand - Japan (1990)

By Market / By Product Category



Panasonic

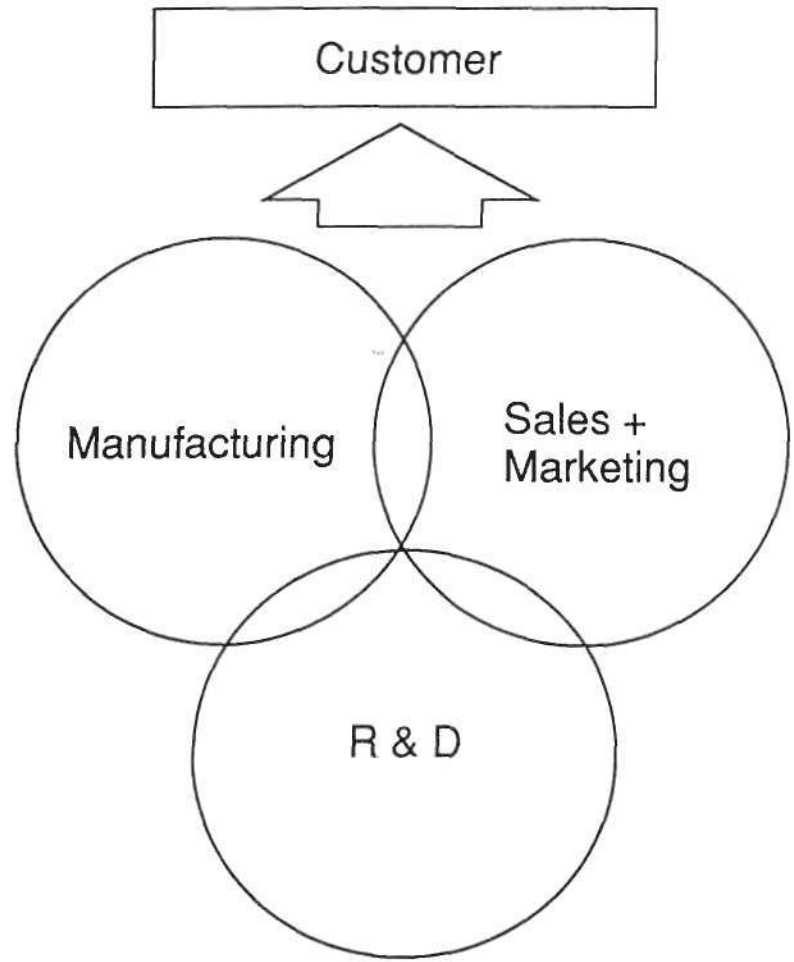
Requirement of The Key Consumer Products

— from the view point of semiconductor manufacturer —

1. High Volume
2. High Quality
3. Differentiation To Meet Diversified Needs
4. Cost Performance

Panasonic

Alliance : Area of Cooperation / Collaboration



Panasonic

Alliance : R & D

- Technology
- Product Development
  - Joint Development
- Standardization
- Design - in

Panasonic

Alliance : Manufacturing

- Technology
- Production Capacity
- Flexibility

Alliance : Sales and Marketing

- Complementary Alliance
- Resale

Panasonic

Key Issues for Alliance

(1) Leading-edge Technology :

— To possess the outstanding original technology

(2) High Suppliability :

— To have a manufacturing site in each economic bloc

(3) High-grade Engineering Service and Support System :

— To utilize both parties' engineering and support systems effectively for successful design-in and sales

Panasonic

Example of Alliances (1)

Actel Corp.

FPGA (Field Programmable Gate Array)

Zero T. A. T.

Alliance

- Manufacturing
- Sales (FPGA, G / A, Other SCs)

Panasonic

Example of Alliances (2)

Power Integrations, Inc.

Intelligent Power MOS Device

— Ideal for downsizing and weight reduction of consumer equipment

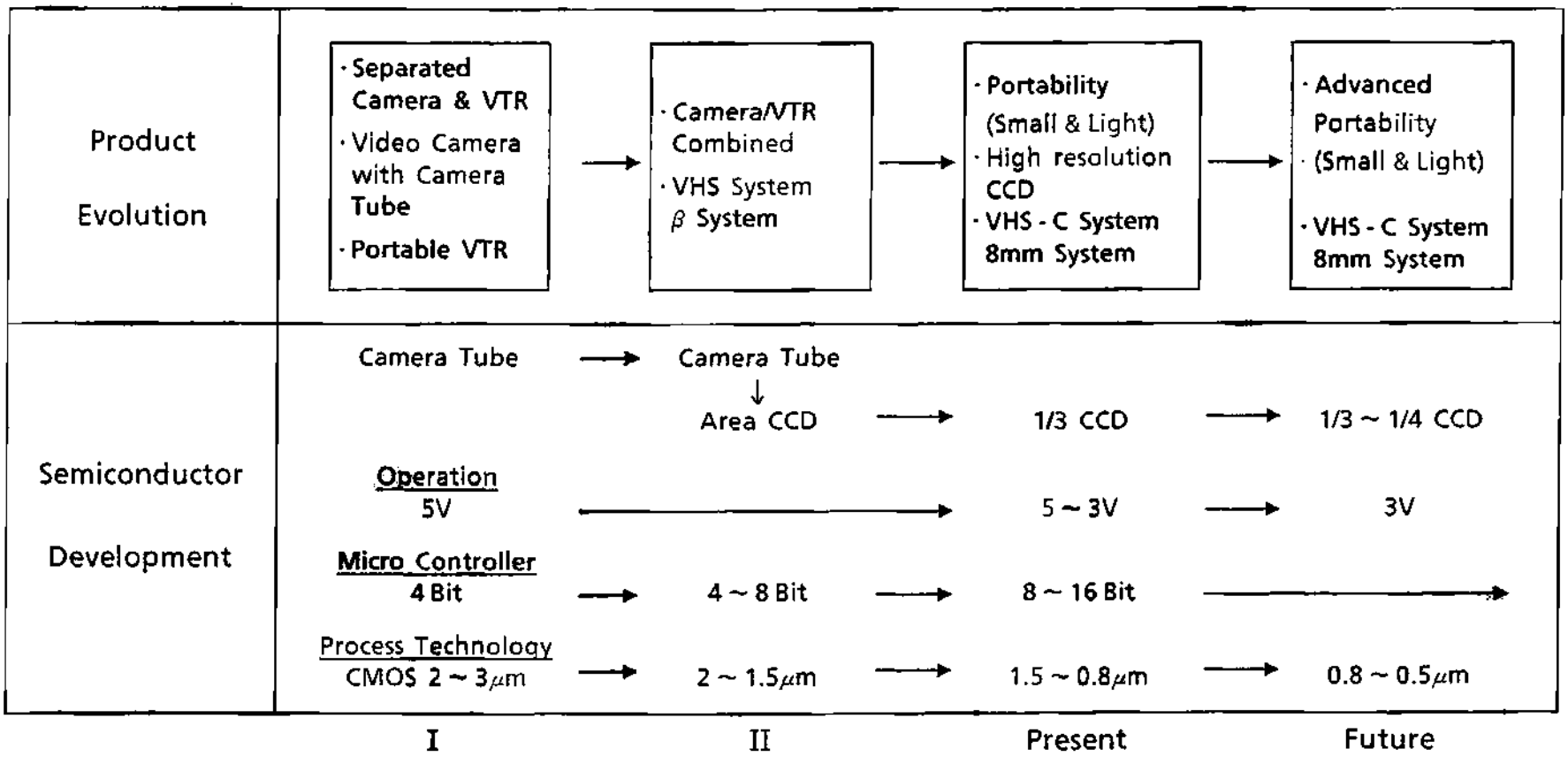
⇩

Alliance

- Manufacturing
- Sales : Intelligent Power MOS Device
  Custom Power MOS Device

Semiconductor Development Toward Product Evolution

Camcoder



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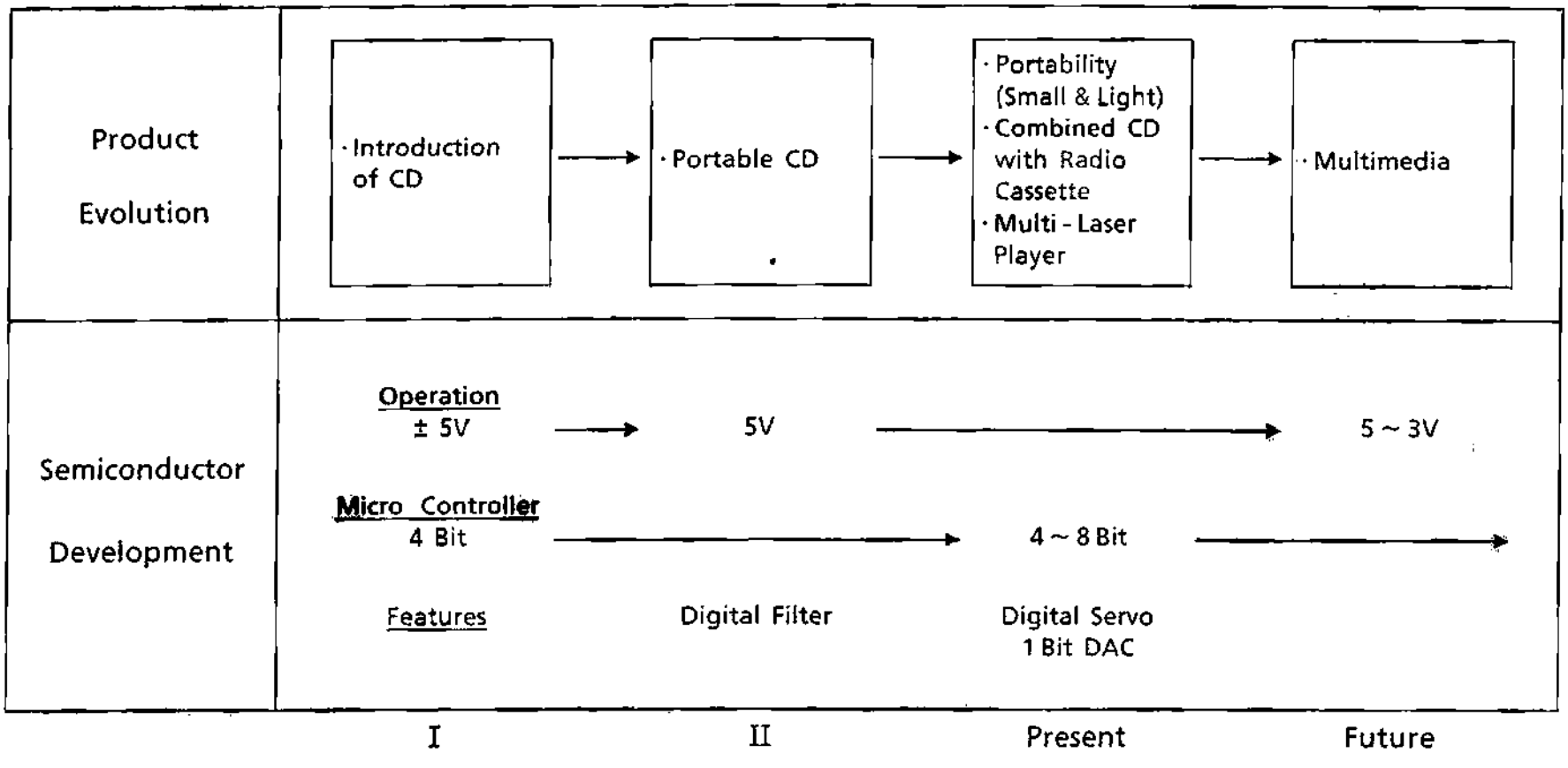
Semiconductor Development Toward Product Evolution

Compact Disc Player



Panasonic

HDSCC [HDTV Semiconductor Cooperation Committee]

Objectives / Activities of HDSCC

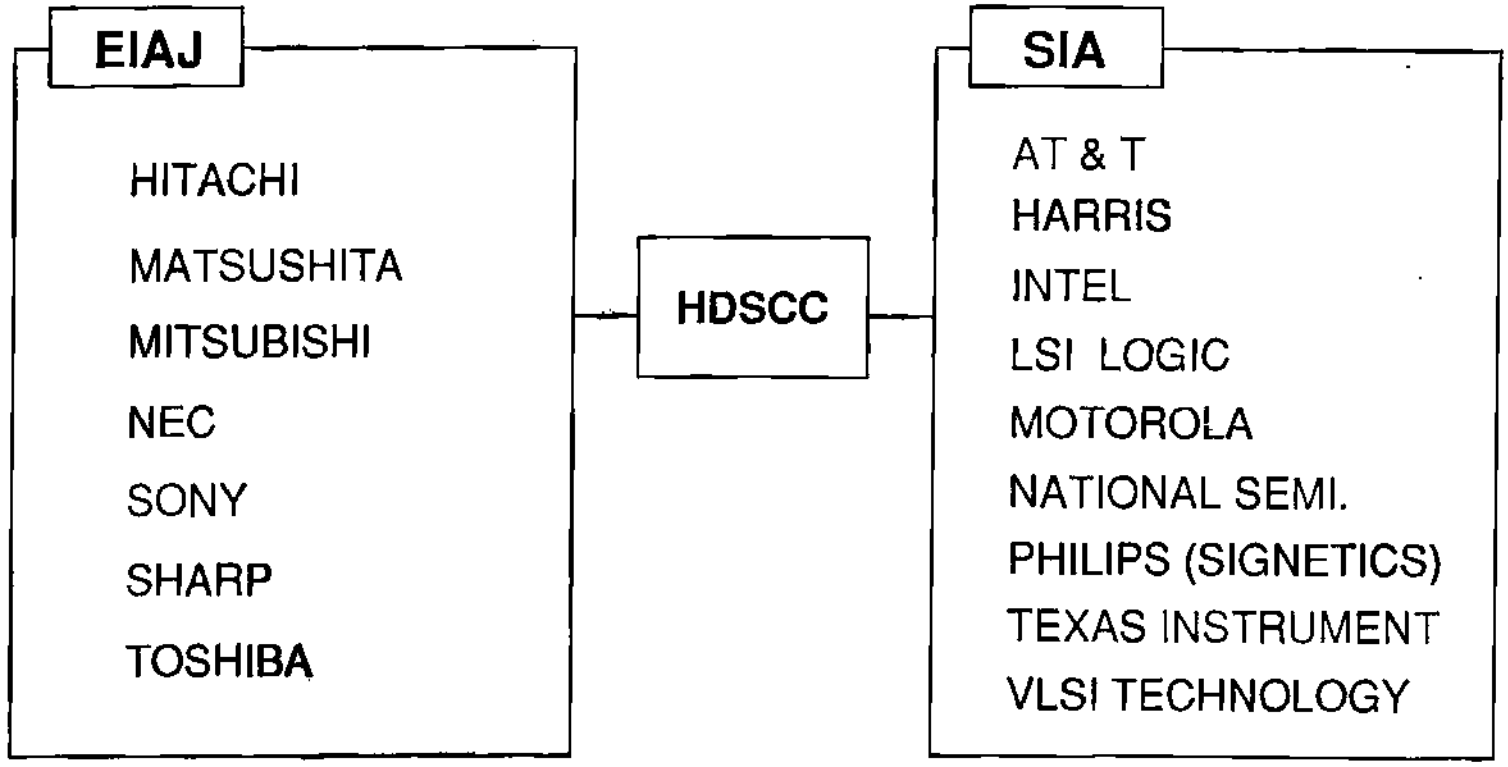
- Increase International Cooperation on HDTV Semiconductors.
- Hold International Symposiums and Exchange Information.
- Conduct Studies and Surveys of Market Trends.

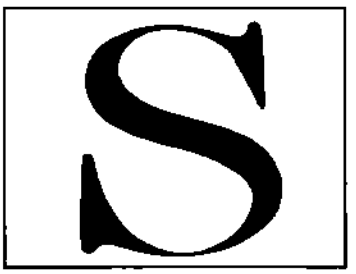
EIAJ / SIA Steering Committee on Market Access and Other Activities

- Joint Publicity Committee
- Cooperative Project to Promote Design-ins
- Telecom Semiconductor Cooperation Project
- **HDTV Semiconductor / Cooperation Committee**
- Industry Cooperation
- Joint Research Project
- Automotive Semiconductor Cooperation Project

Panasonic

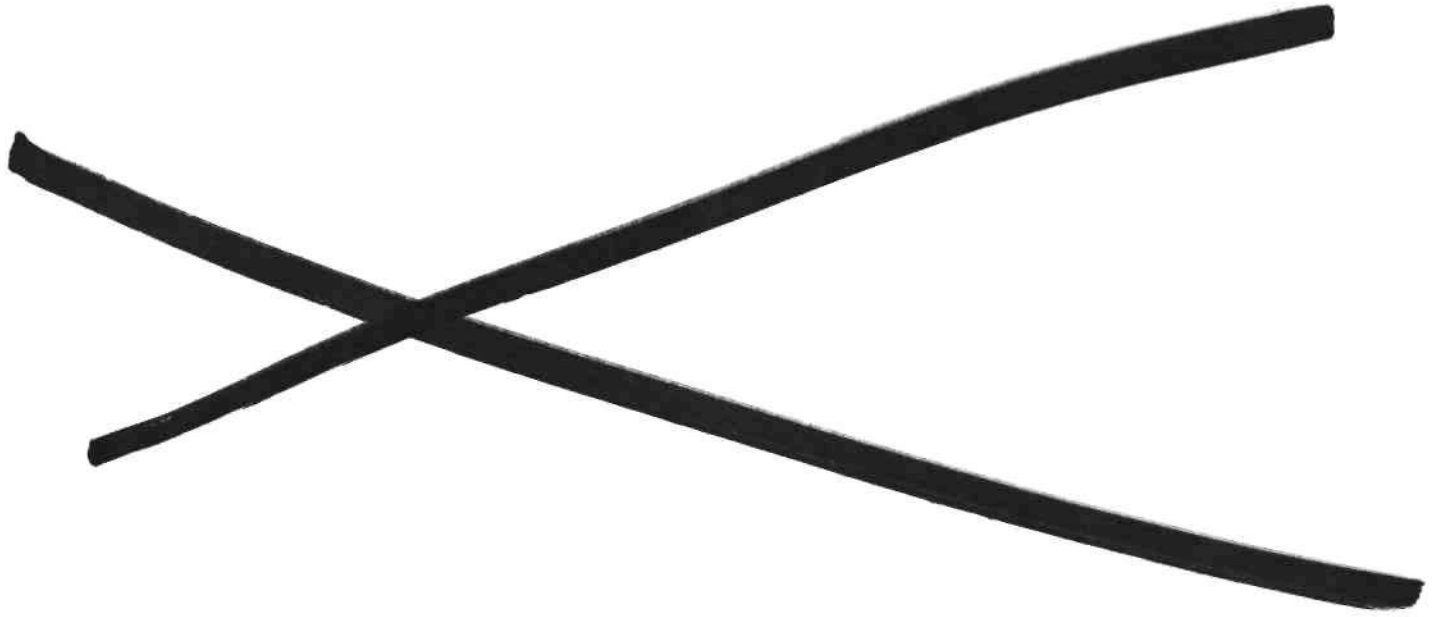
Organization of HDSCC





Panel Discussion

How Alliances Foster International Cooperation



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TECH Semiconductor: A New Semiconductor Alliance in Singapore

David V. Smith
President
TECH Semiconductor Singapore Pte., Ltd.

Mr. Smith is President of TECH Semiconductor Singapore. He was appointed to his present position in August 1991. Prior to joining TECH Semiconductor, he spent 20 years with Texas Instruments in various manufacturing and management positions. He spent the last 14 years in Asia in positions that included Managing Director of Texas Instruments Malaysia (1983-1985) and Managing Director of Texas Instruments Singapore (1985-1991). Mr. Smith holds a bachelor's degree in Mathematics from the University of Arkansas and a master's degree in Mathematics from East Texas State University.

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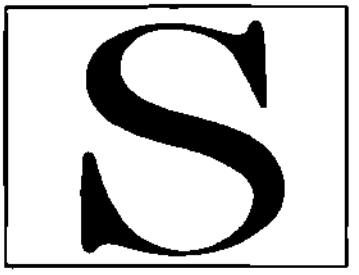
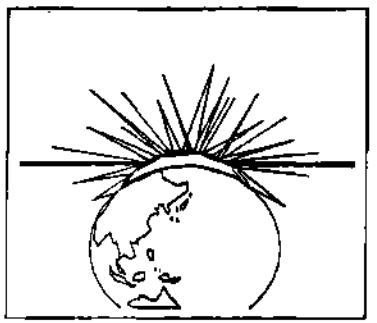


TECH Semiconductor: A New Semiconductor Alliance in Singapore

David V. Smith
President
TECH Semiconductor Singapore Pte. Ltd.



ALLIANCES IN A **CHANGING**
SEMICONDUCTOR **INDUSTRY**

TECH SEMICONDUCTOR:

A NEW SEMICONDUCTOR ALLIANCE IN SINGAPORE

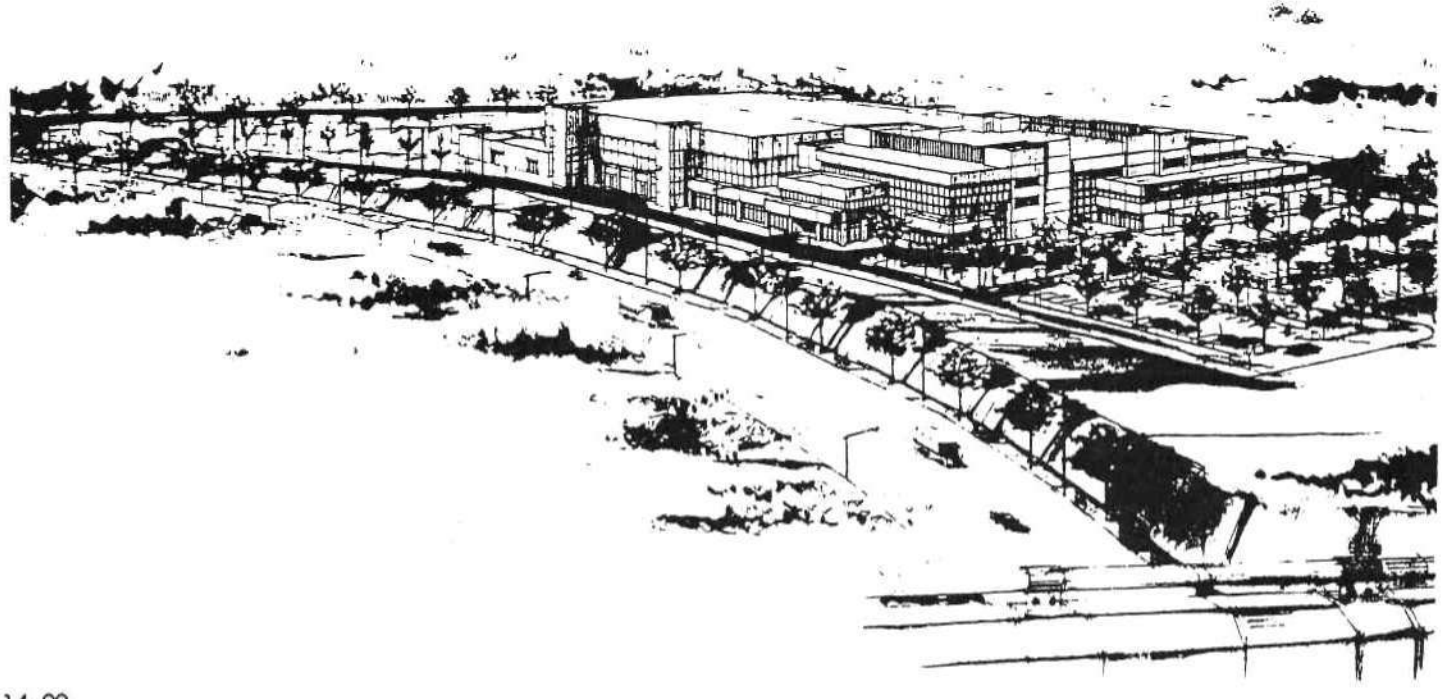
David V. Smith

PRESIDENT
TECH SEMICONDUCTOR

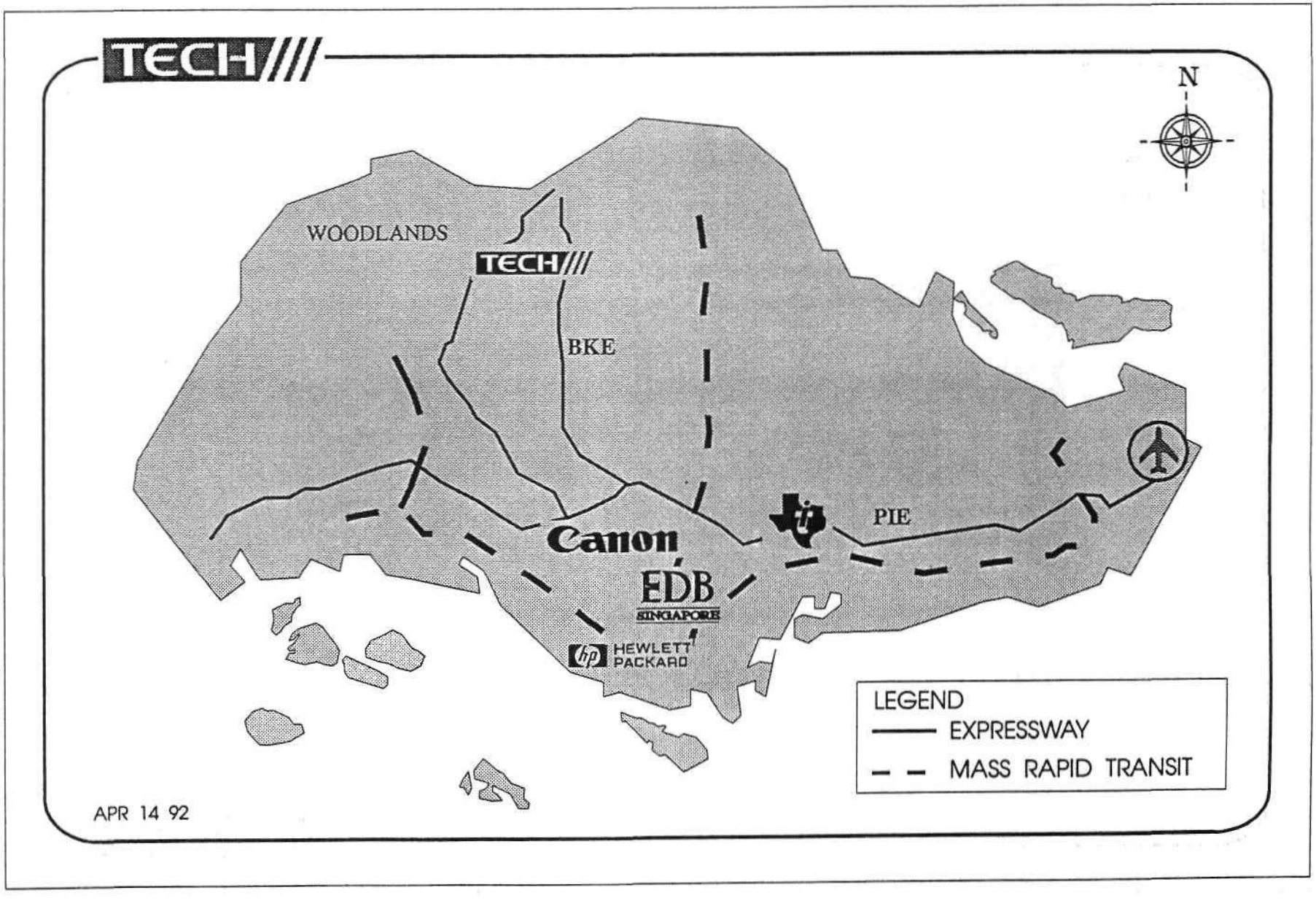
TECH

TECH SEMICONDUCTOR

SUBMICRON WAFER FAB AT WOODLANDS AVENUE 3



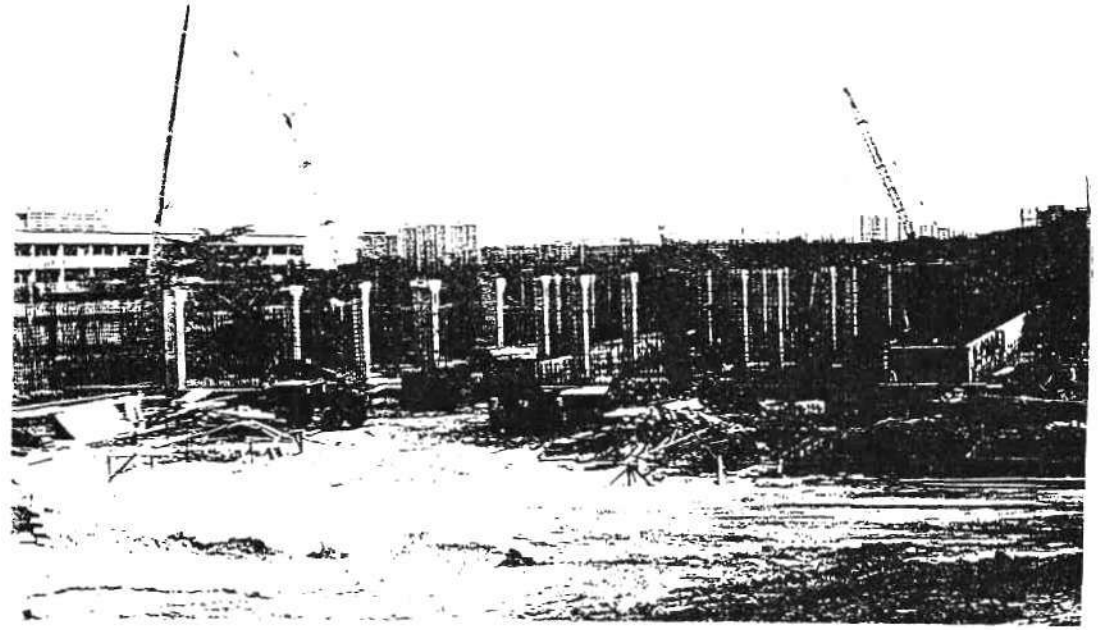
APR 14 92



TECH///

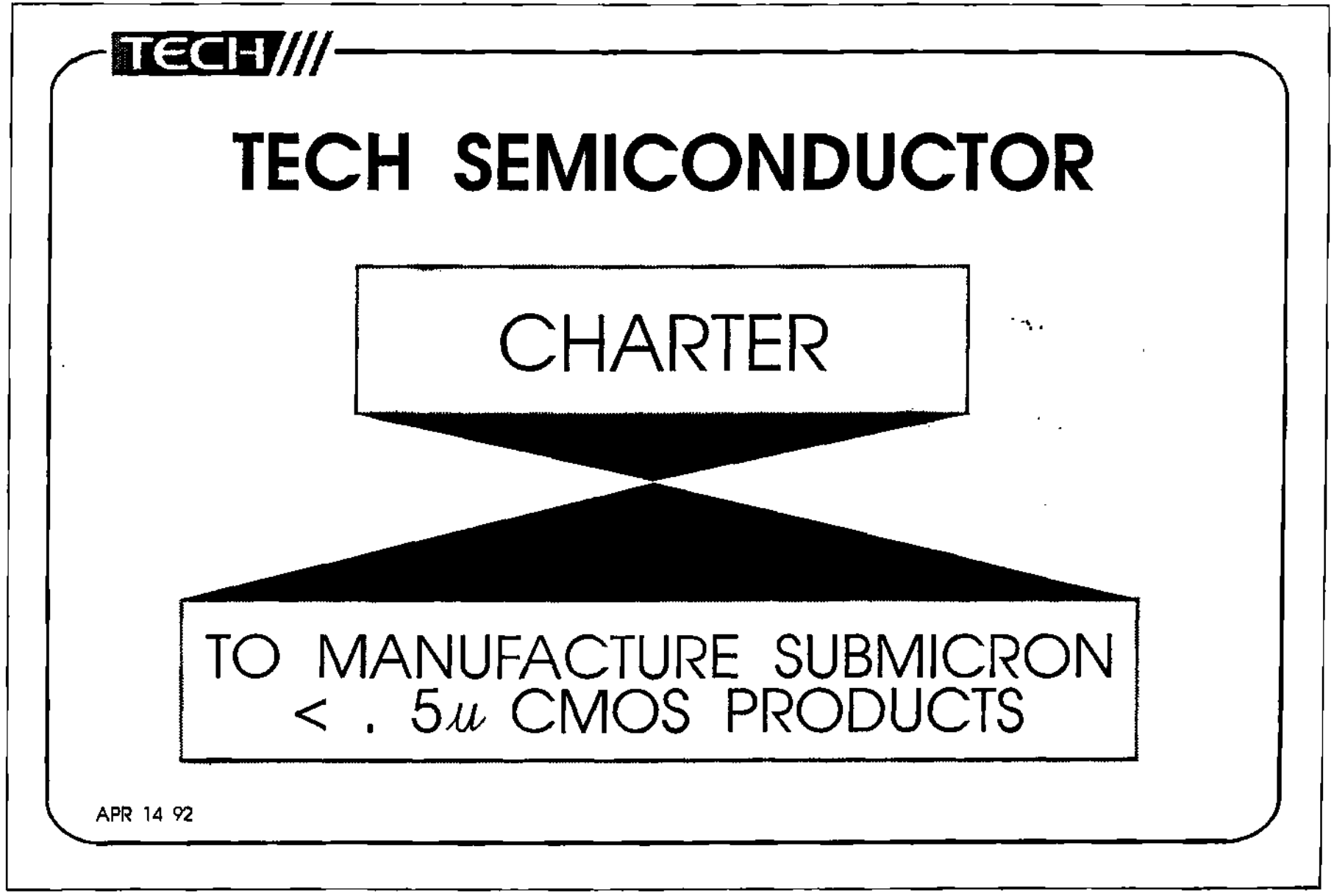
TECH SEMICONDUCTOR

CONSTRUCTION STATUS



COMMENCED	: JAN 2, 1992	FAB BLDG AREA	: 16,484 M^2
COMPLETION	: DEC 31, 1992	BLDG & FACILITY AREA	: 35,280 M^2
		LAND AREA	: 91,955 M^2

APR 14 92



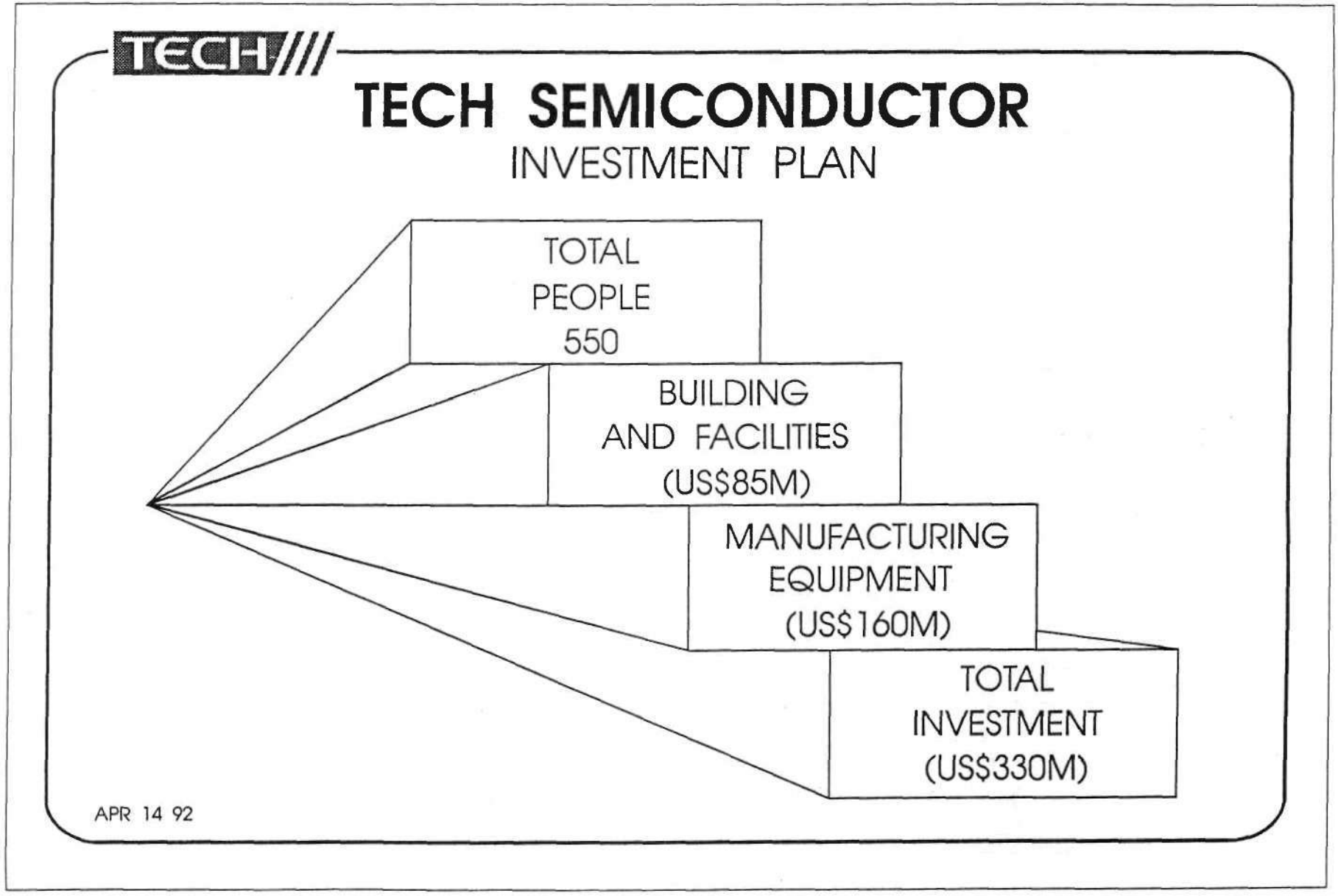
TECH///

TECH SEMICONDUCTOR

MILESTONES

JOINT VENTURE FORMED	APR 91
START OF CONSTRUCTION	JAN 92
FIRST WAFER START	MAR 93
FIRST 16MB DRAM CHIP	MAY 93
PRODUCT QUALIFICATION	SEP 93
6K WAFER STARTS PER MONTH	JAN 94

APR 14 92



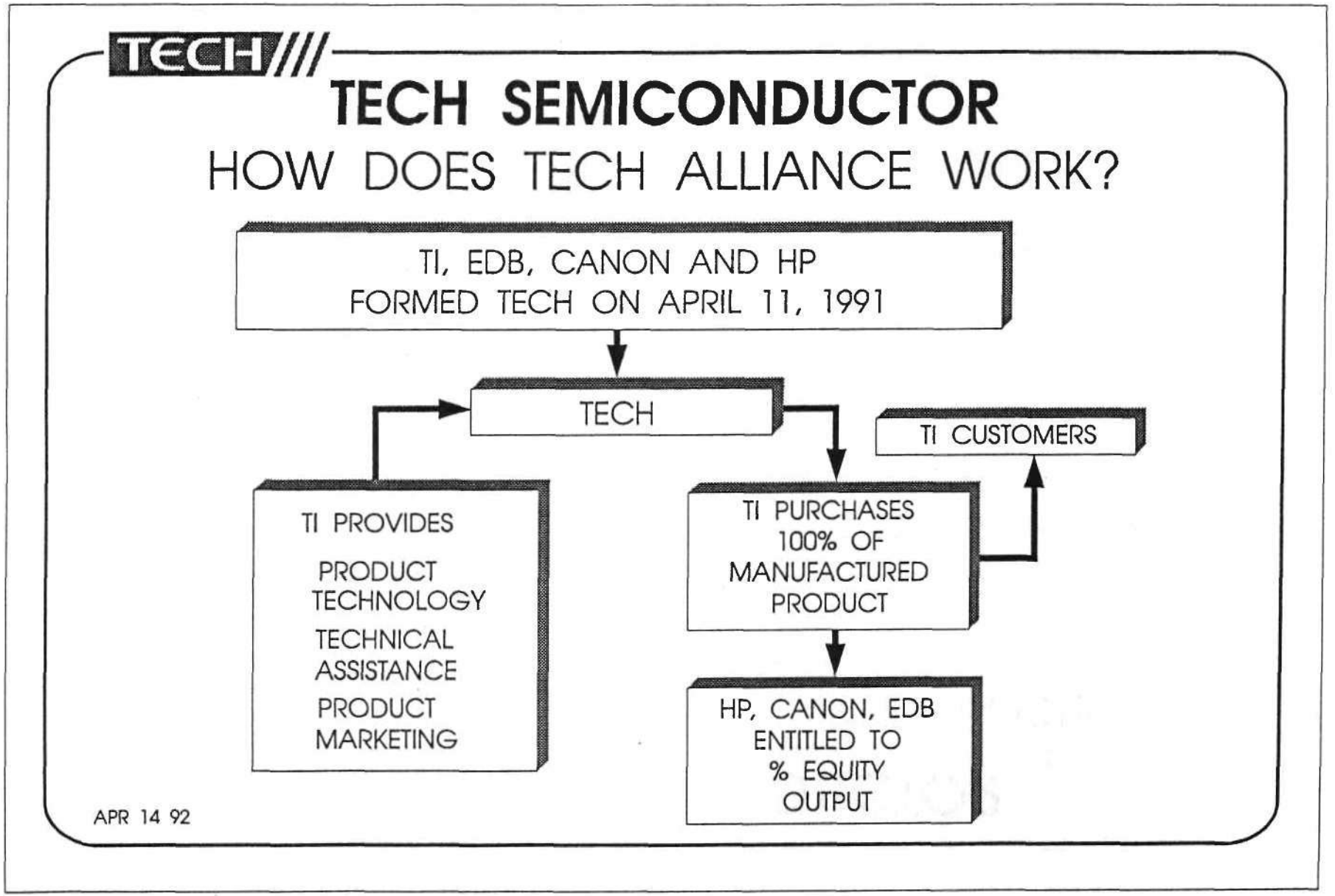
TECH///

TECH SEMICONDUCTOR

MANUFACTURING CAPABILITY

		FACILITY	PROCESS	EQUIPMENT
1992	PHASE I	.35μ	.5μ	.5μ
	UPGRADEABLE TO 64 MB PRODUCT CAPABILITY		.35μ	.35μ
	CLEANROOM : 3,920 M^2			
	CAPACITY : 6K TO 10K 200mm WAFER STARTS PER MONTH			
1996	PHASE II	.2μ	.2μ	.2μ
	UPGRADEABLE TO 256MB PRODUCT CAPABILITY			
	CLEANROOM : 3,920 M^2			
	CAPACITY : 10K 250mm WAFER STARTS PER MONTH			

APR 14 92



TECH///

TECH SEMICONDUCTOR

WHY TECH JOINT VENTURE IN SINGAPORE? TI's POINT OF VIEW

- SHARED CAPITAL INVESTMENT
- INCREMENTAL SUBMICRON CMOS CAPACITY
- ENHANCED STRATEGIC SUBMICRON CMOS MAKE AND MARKET PRESENCE IN SOUTH EAST ASIA
- EACH SHAREHOLDER HAS PRODUCT OFF TAKE OPTION UP TO EQUITY %'s
- ENHANCED CUSTOMER-SUPPLIER INTERACTION FOR SUBMICRON CMOS PRODUCT QUALIFICATION
- GOVERNMENT INCENTIVES

APR 14 92

TECH///

TECH SEMICONDUCTOR

WHY TECH JOINT VENTURE IN SINGAPORE? EDB's POINT OF VIEW

SINCE

- MICROELECTRONICS INDUSTRY DEVELOPMENT IS VITAL TO SINGAPORE's ELECTRONIC INDUSTRIALIZATION
- SUBMICRON DRAM CMOS CHIP MANUFACTURING IS THE SEMICONDUCTOR TECHNOLOGY DRIVER

TECH

- PROVIDES ACCESS TO ADVANCED SUBMICRON CMOS TECHNOLOGY
- REDUCES THE LEARNING CURVE EXPERIENCE
- SPINS OFF THE DEVELOPMENT OF ANCILLARY INDUSTRIES
- PROVIDES ESSENTIAL FOUNDATION FOR R&D EXPANSION

APR 14 '92

TECH///

TECH SEMICONDUCTOR

WHY TECH JOINT VENTURE IN SINGAPORE? CANON's POINT OF VIEW

- ASSURED SUPPLY OF SUBMICRON CMOS CHIPS - AS A MAJOR CONSUMER ELECTRONICS MANUFACTURER AND SEMICONDUCTOR WAFER FAB EQUIPMENT MANUFACTURER
- CONTINUED CLOSE INTERACTION WITH TI, EDB AND HP
- SHARED CAPITAL INVESTMENT
- GOVERNMENT INCENTIVES

APR 14 92

TECH///

TECH SEMICONDUCTOR

WHY TECH JOINT VENTURE IN SINGAPORE? HP's POINT OF VIEW

- CONTINUED CUSTOMER-SUPPLIER INTERACTION (TI/HP) FOR MAJOR WORLDWIDE COMPUTER MANUFACTURER
- CONTINUED CLOSE INTERACTION WITH TI, EDB AND CANON
- SHARED CAPITAL INVESTMENT
- ASSURED LOCAL SOURCE OF SUBMICRON CMOS CHIPS
- GOVERNMENT INCENTIVES

APR 14 92

TECH///

TECH SEMICONDUCTOR

WHY TECH?

EXCELLENT STRATEGIC SHAREHOLDERS' ALLIANCE

T	I	DRAM TECHNOLOGY LEADER
E	D B	GOVERNMENT AGENCY
C	A N O N	CONSUMER ELECTRONICS AND SEMICONDUCTOR END EQUIPMENT MANUFACTURER
H	P	WORLDWIDE COMPUTER MANUFACTURER

TI PROVIDES

- LEADING EDGE SUBMICRON CMOS TECHNOLOGY
- START-UP TECHNICAL ASSISTANCE
- ESTABLISHED CUSTOMERS' BASE
- R&D
- EQUITY FUNDS
- MARKETING OUTLETS

SGP GOVERNMENT INCENTIVES

- TAX HOLIDAY
- TRAINING GRANTS
- LOANS
- EQUITY FUNDS

CANON AND HP PROVIDE

- EQUITY FUNDING
- EXCELLENT TEACHER ON PRODUCT QUALIFICATION INPUTS
- PRODUCT OFF TAKE UP TO EQUITY %'s

APR 14 92

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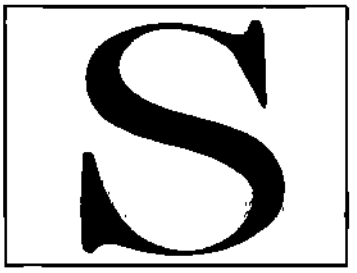
The Korean Semiconductor Industry and Strategic Alliances

C.S. Park
Senior Vice President
Hyundai Electronics Industries Co., Ltd.

Mr. Park is Senior Vice President and General Manager of Semiconductor Marketing and Sales Division of Hyundai Electronics Industries. Since joining Hyundai, he has held various management positions including Head of Corporate Planning Office, and General Manager of North American Marketing and Sales Division. From 1985 to 1989, Mr. Park worked in the United States as President and CEO of Hyundai Electronics America. He was also a member of the board of directors of International CMOS Technology Inc. Mr. Park holds a bachelor's degree from Yonsei University in Seoul, an M.B.A. from the University of Chicago, and a Ph.D. from Nova University.

Dataquest Incorporated
JAPANESE SEMICONDUCTOR INDUSTRY CONFERENCE
April 13-14, 1992
Tokyo, Japan



The Korean Semiconductor Industry and Strategic Alliances

C.S. Park
Senior Vice President
Hyundai Electronics Industries Co.,Ltd.

Korean Semiconductor Industry and Strategic Alliances

Dataquest Conference in Tokyo

Hyundai Electronics Industries Co., Ltd.

Korean Semiconductor Industry Background

* Foreign companies set up assembly lines, from 1965 through 1973.
* Wafer fabrication started in 1974 with Korea Semiconductor which Samsung acquired in 1978.
* Taihan Semiconductor, founded in 1976, was acquired by Goldstar and reborn as an AT&T joint venture.
* Hyundai Electronics Industries entered the market in 1983.
* Of more than 100 Semiconductor-related companies, just five do actual wafer fabrication.
* Large back-end assembly industry established.

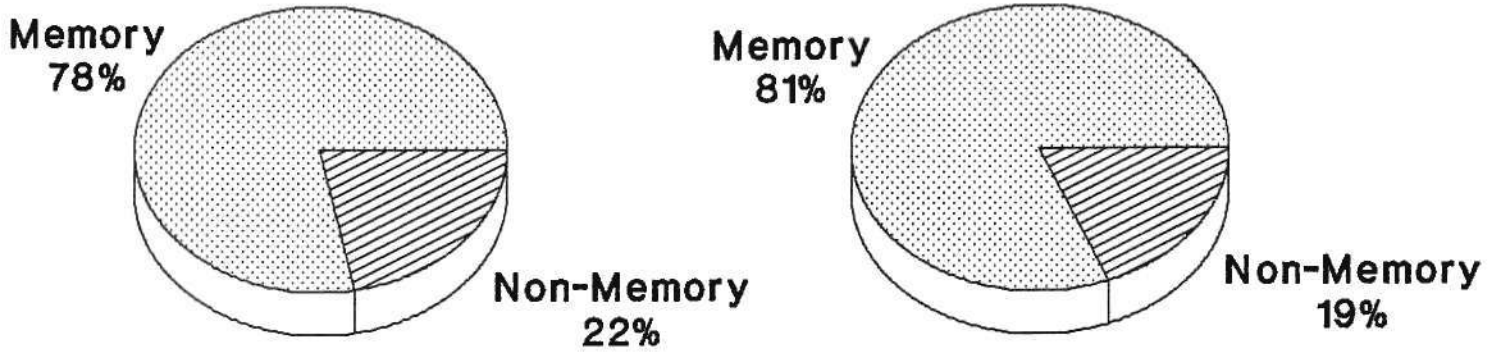
Major Korean Semiconductor Suppliers

* Divisions of large vertically-integrated companies.
* DRAMs used as technology driver and largest revenue source.
* Heavily dependent upon foreign suppliers of production equipment.
* Have technical alliances with foreign suppliers.

Korean Semiconductor Alliance Background

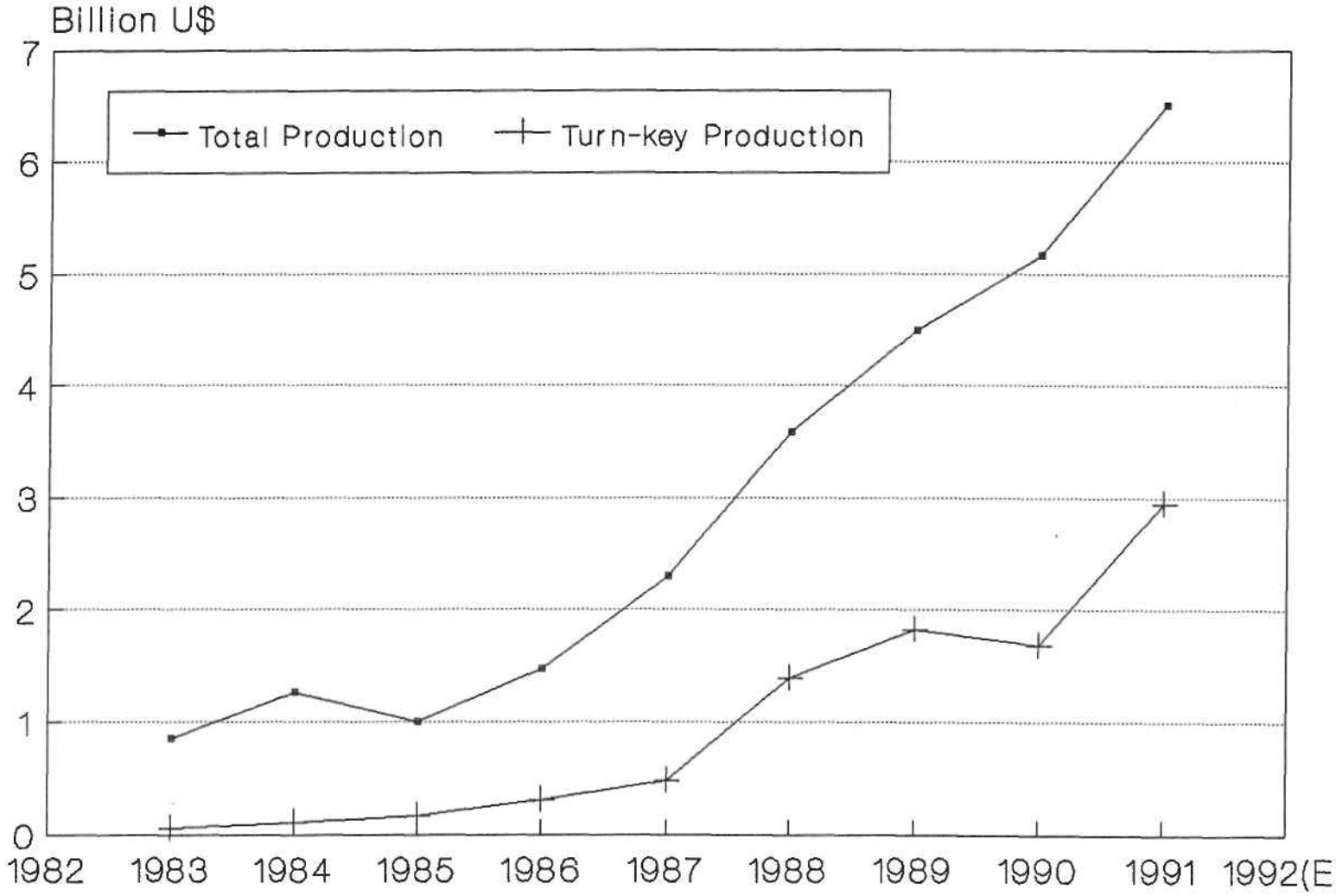
- Licensed product designs and processes from foreign suppliers.
- Provided foundry and private label services for foreign suppliers.
- Foreign suppliers benefited from Korean investment in increased sales revenue, profitability, market share and presence.
- Development helped by foreign alliances.

Memory vs. Non-Memory
Korean Semiconductors



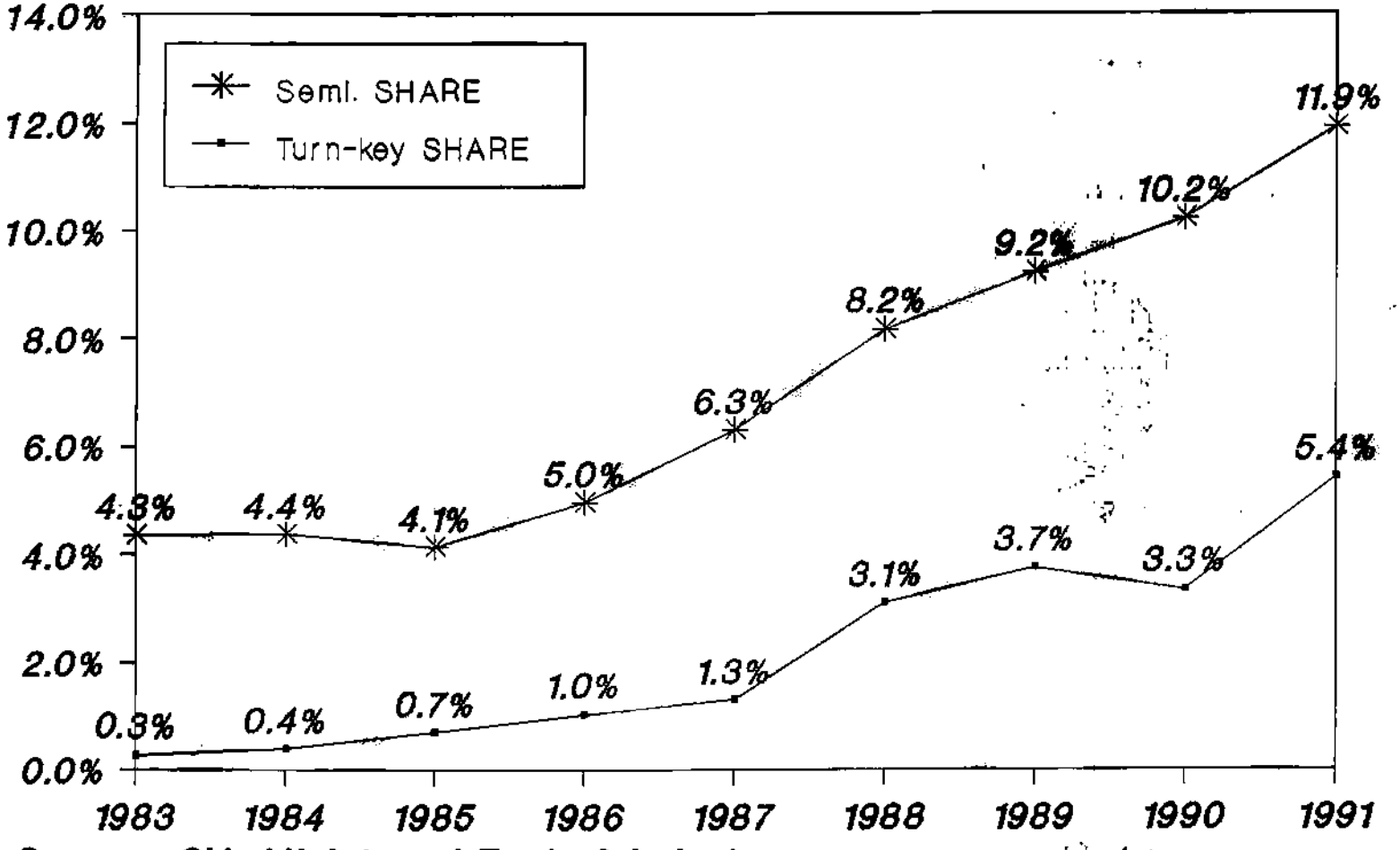
Source : Ministry of Trade & Industry

Korean Semiconductors



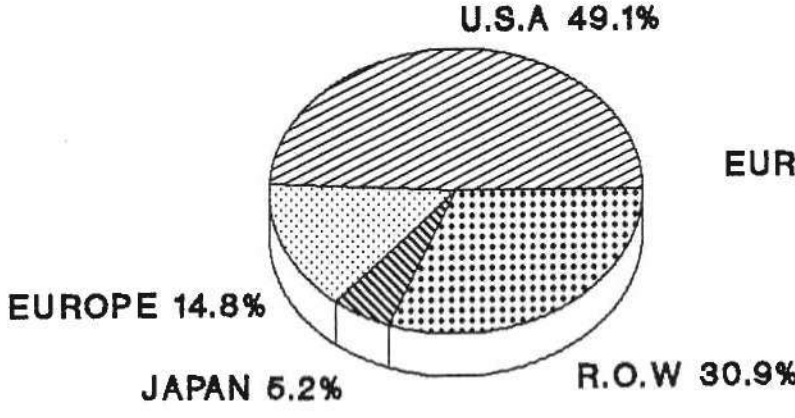
Source : Ministry of Trade & Industry

Korean Semiconductors
Worldwide Production Share

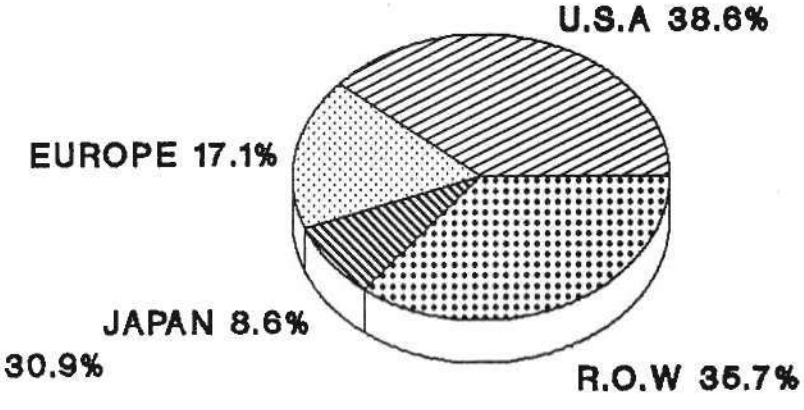


Source : SIA, Ministry of Trade & Industry

Export Portion by Region
MOS Memory Devices



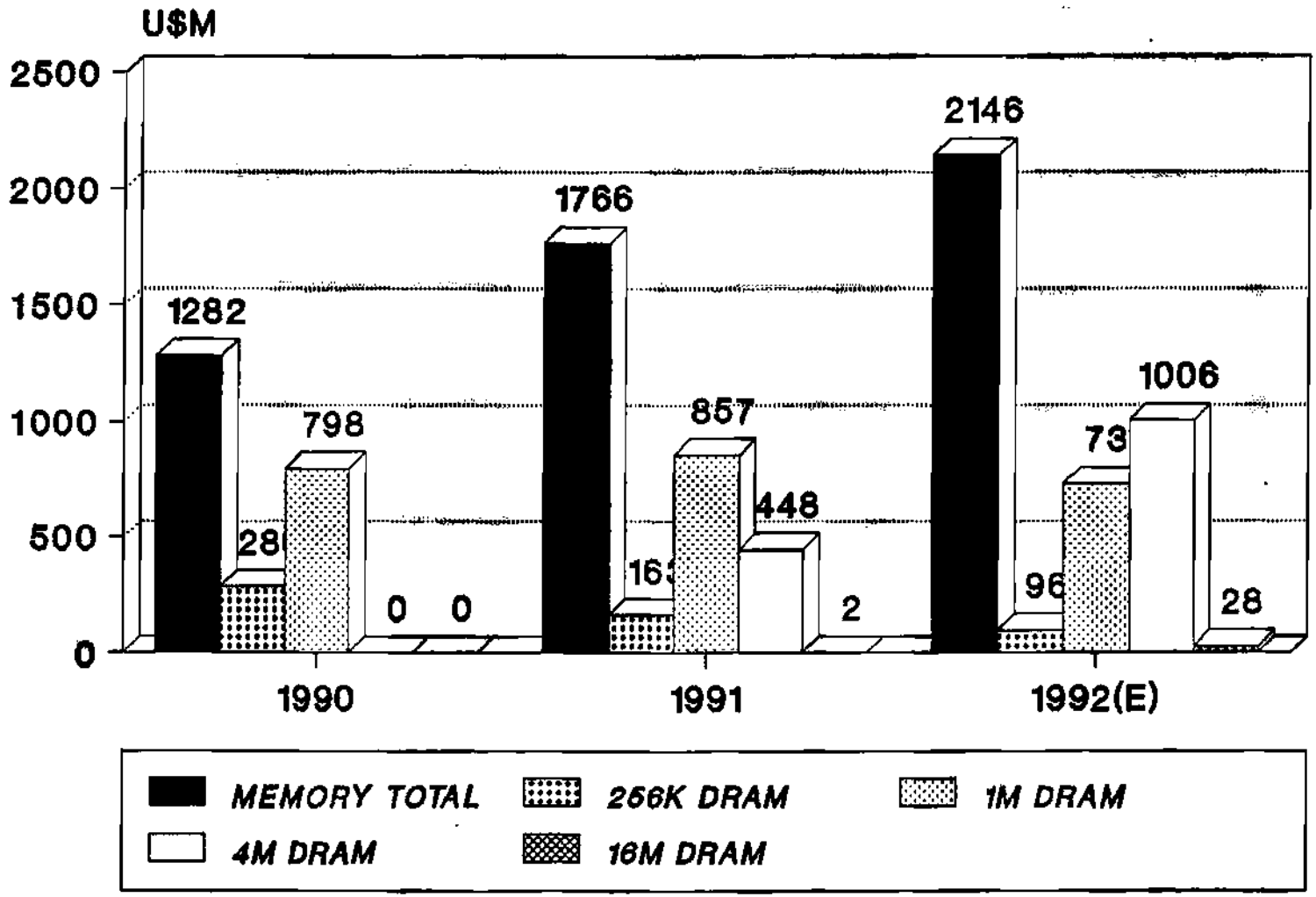
1990
(1282MU$)



1991
(1766MU$)

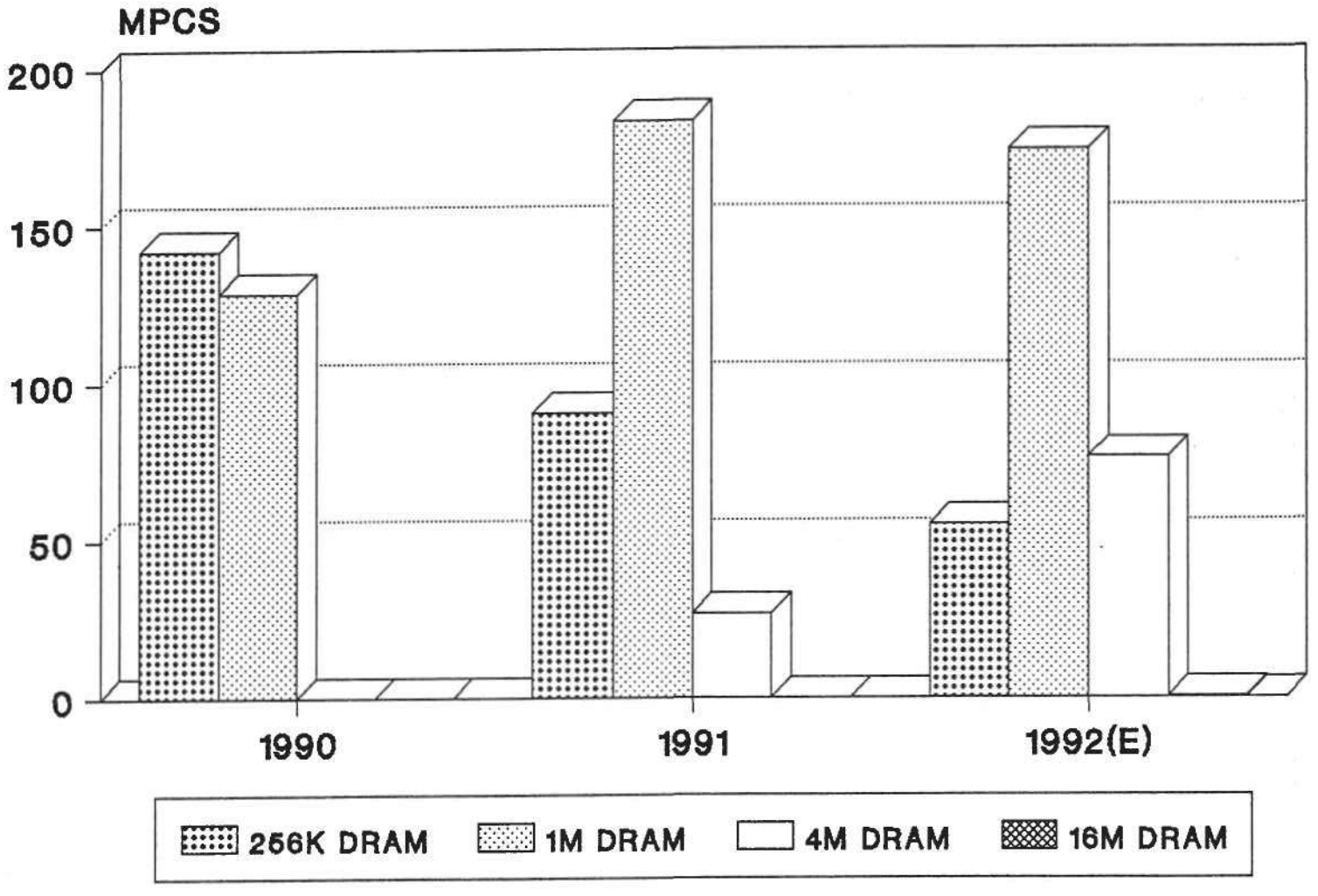
Source : Dataquest

Korean Memory Shipment



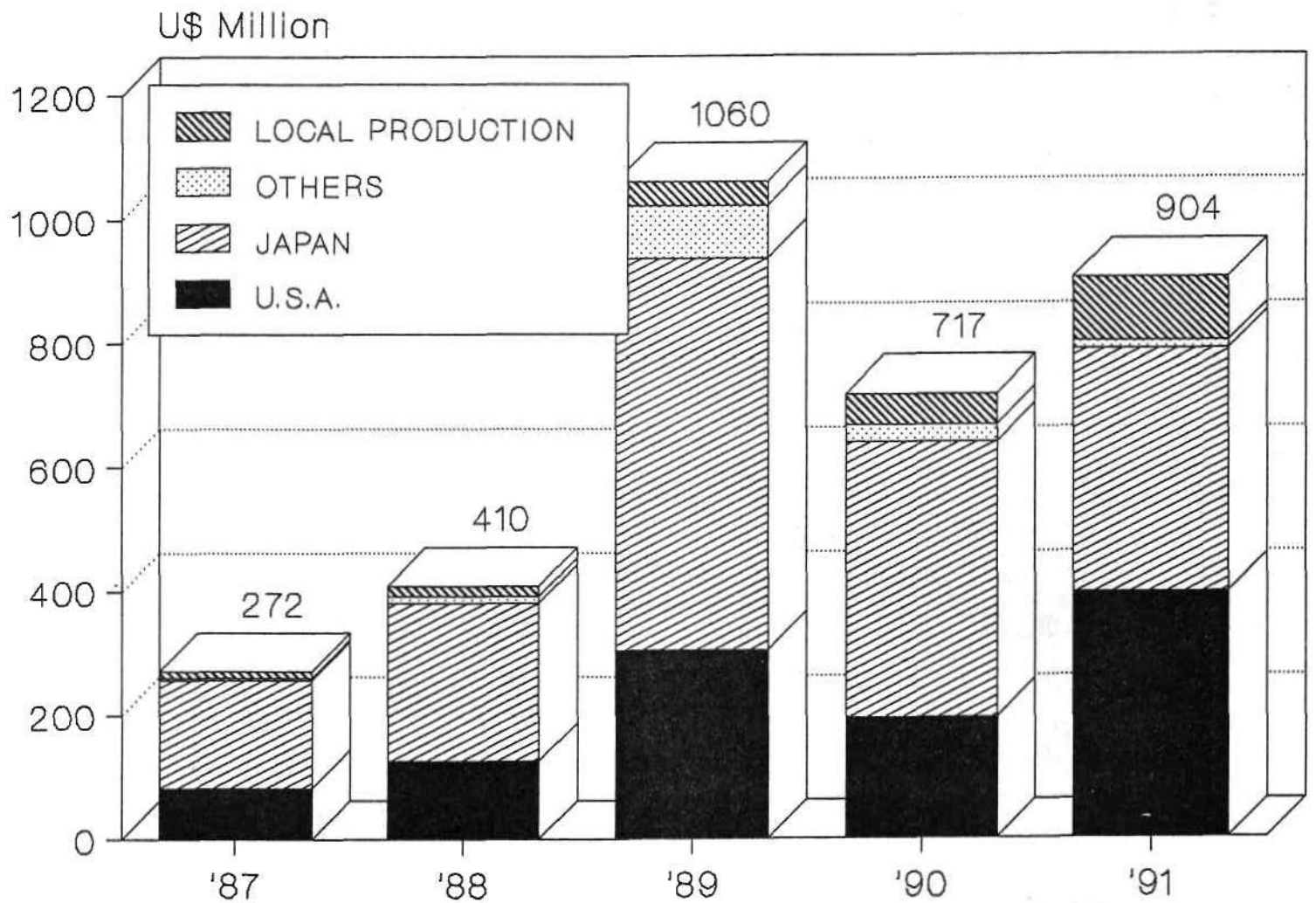
Source : Dataquest

Korean DRAM Shipment



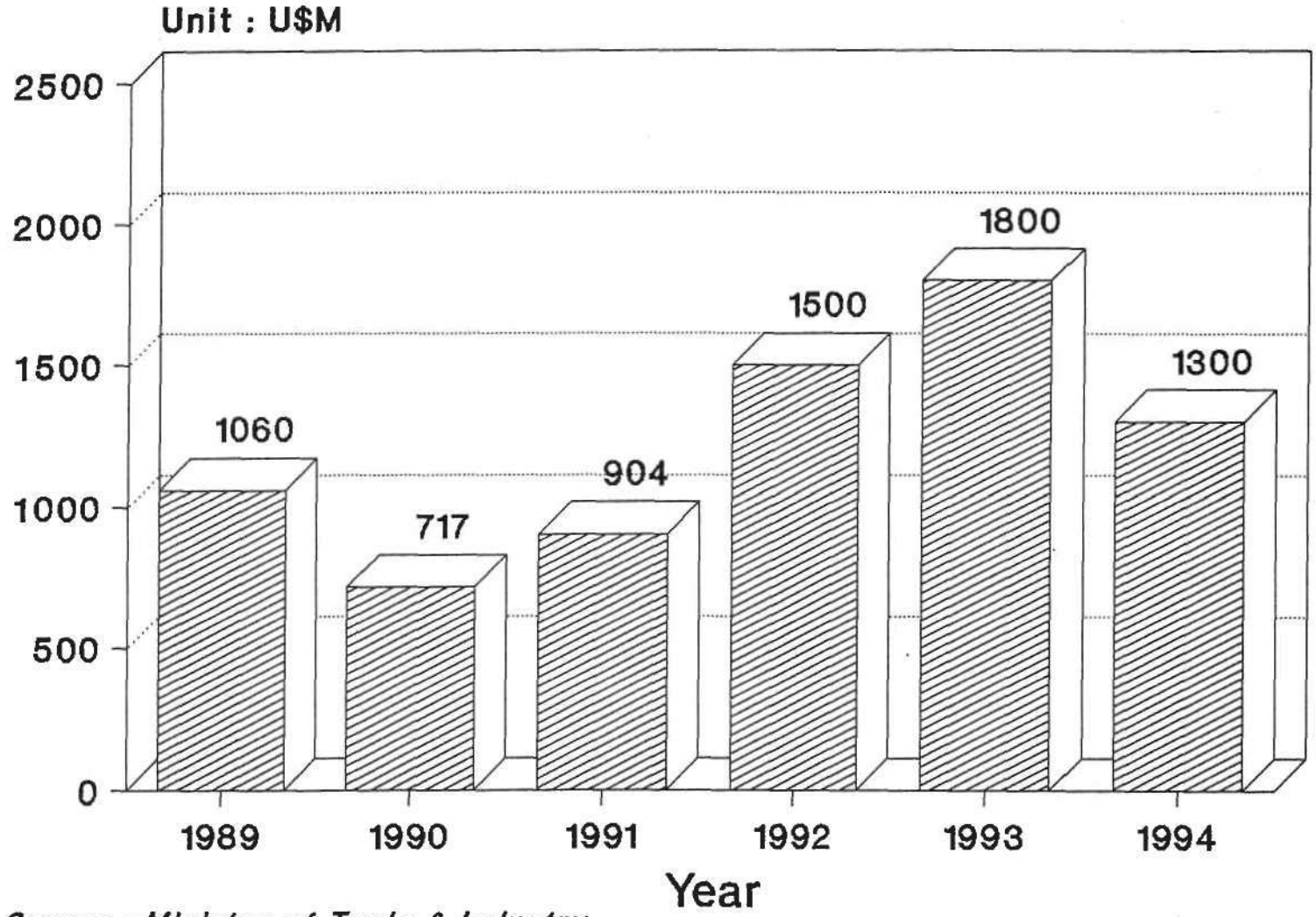
Source : Dataquest

Fab Equipment Purchase



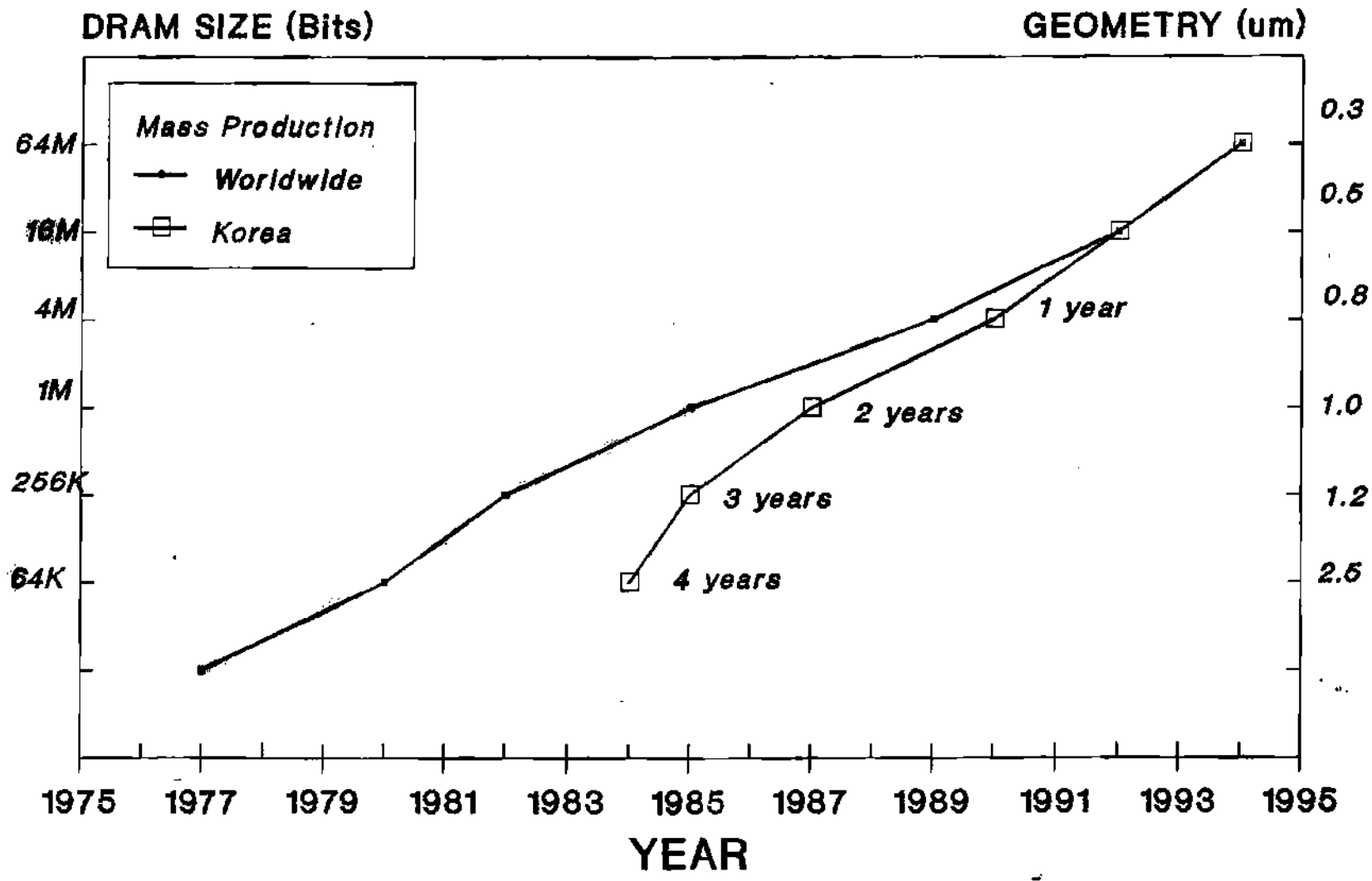
Source : MInIstry of Trade & Industry

Fab Equipment Purchase



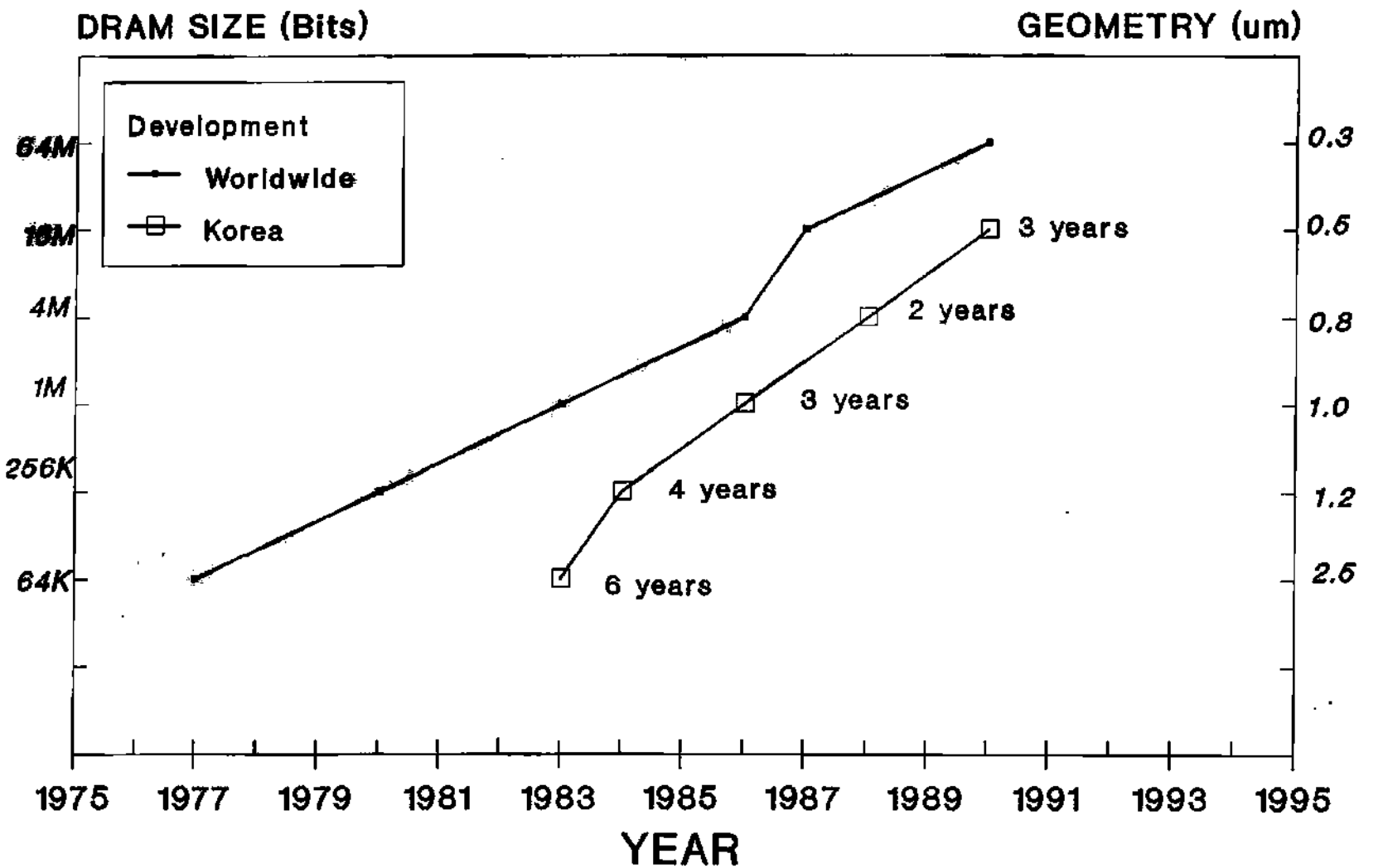
Source : Ministry of Trade & Industry

DRAM Technology Gap



Source : EIAK

DRAM Technology Gap



Source : EIAK

Factors Influencing Future Semiconductor Alliance Relationships

* Technology strength.
* Respect of intellectual property rights.
* Korean suppliers consider foreign markets to be strategically important.
* Foreign suppliers desire to provide semiconductor product to Korean end-equipment manufacturers.
* Recognition of progress made by Korean memory suppliers.
* Korean suppliers have less need for licensed memory designs and processes.
* Korean suppliers have less need to provide memory foundry and private label services.
* Enormous resources required to develop leading-edge products.

Future Korean Semiconductor Alliance Strategy

- Engage with high technology companies to jointly develop leading-edge products.
- Broaden product portfolio and gain immediate market presence by engaging with those companies who would provide foundry and private label services.
- Support strategic partners with foundry and private label services.
- Provide opportunity for strategic partners to supply semiconductor to end-equipment manufacturing divisions.
- Optimize resource investment in order to provide the market with valued products.

Korean Semiconductor Alliance Summary

Strong desire to maintain and establish alliances with strategic partners for the mutual benefit of both parties.

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Taiwan: Ready and Perfect Position for Future IC Industry Growth

John Hsuan
President
United Microelectronics Corporation

Mr. Hsuan is President of United Microelectronics Corporation (UMC) in Taiwan. He has held various management positions in purchasing and marketing in Taiwan's governmental organizations. Mr. Hsuan joined UMC as Sales Director in 1982 and was promoted to Vice President of Marketing in 1985. He was named President in September 1990. Mr. Hsuan received the Most Outstanding Marketing Manager Award from the Chinese Association for the Advancement of Management (CAAM) in 1985 and Feng-Chang Leu Memorial Award form the Chinese Management Association in 1989. Mr. Hsuan graduated from Chiao Tung University with a bachelor's degree in Electronics Engineering.

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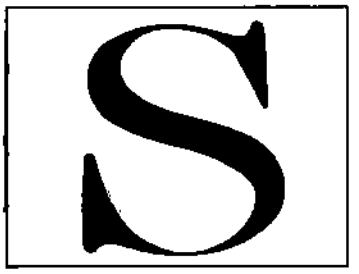


Taiwan: Ready and Perfect Position for Future IC Industry Growth

John Hsuan
President
United Microelectronics Corporation

TAIWAN

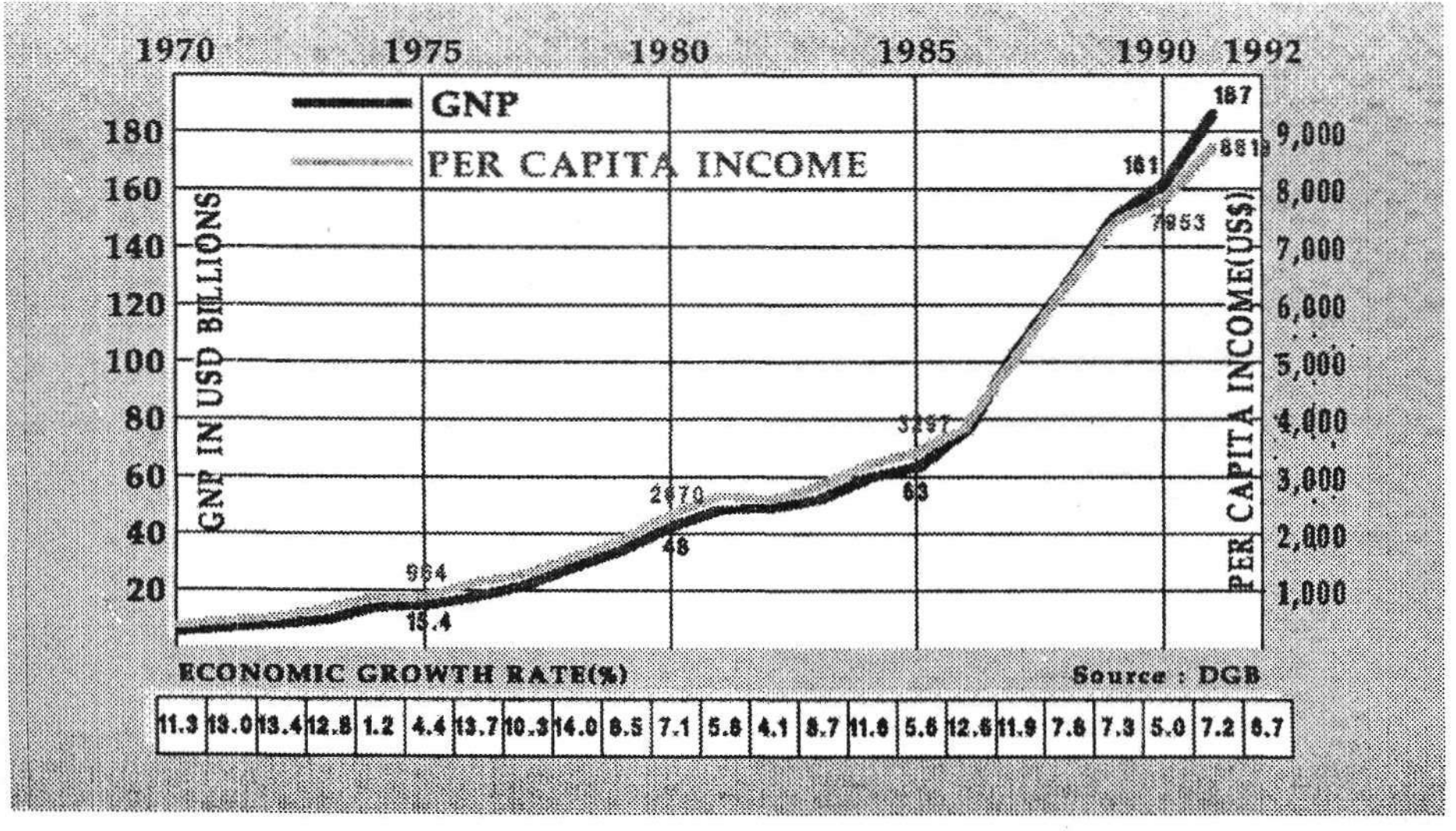
READY AND IN PERFECT POSITION FOR FUTURE IC INDUSTRY GROWTH

Taiwan – Moving ahead toward the 21st century

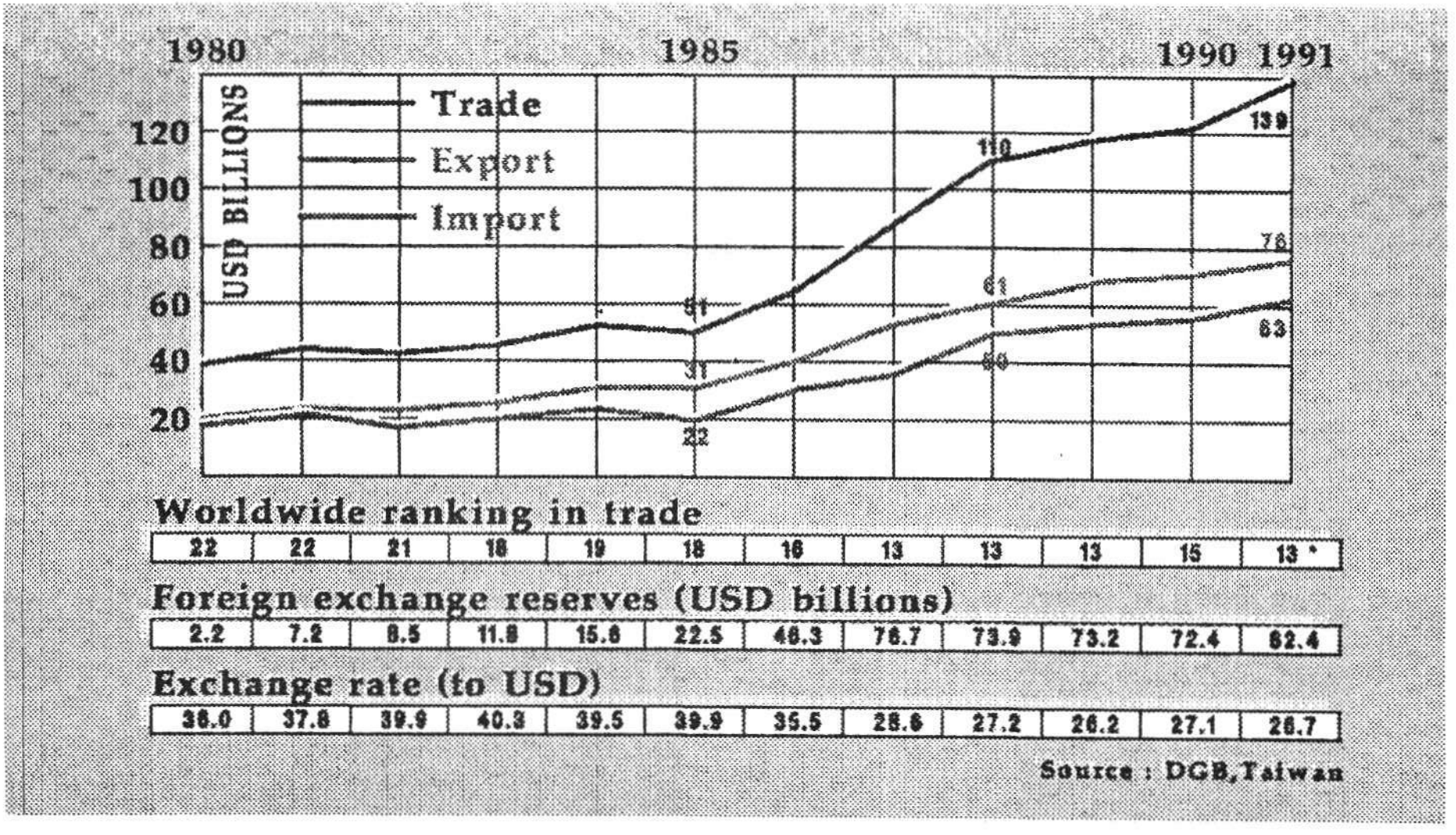
PC Industry – An example of Taiwanese experience

Taiwan – Ideal partner with Japanese IC companies

TAIWAN ECONOMIC INDICES



TAIWAN ECONOMIC INDICES



Worldwide ranking in trade

22	22	21	18	19	18	16	13	13	13	15	13 *

Foreign exchange reserves (USD billions)

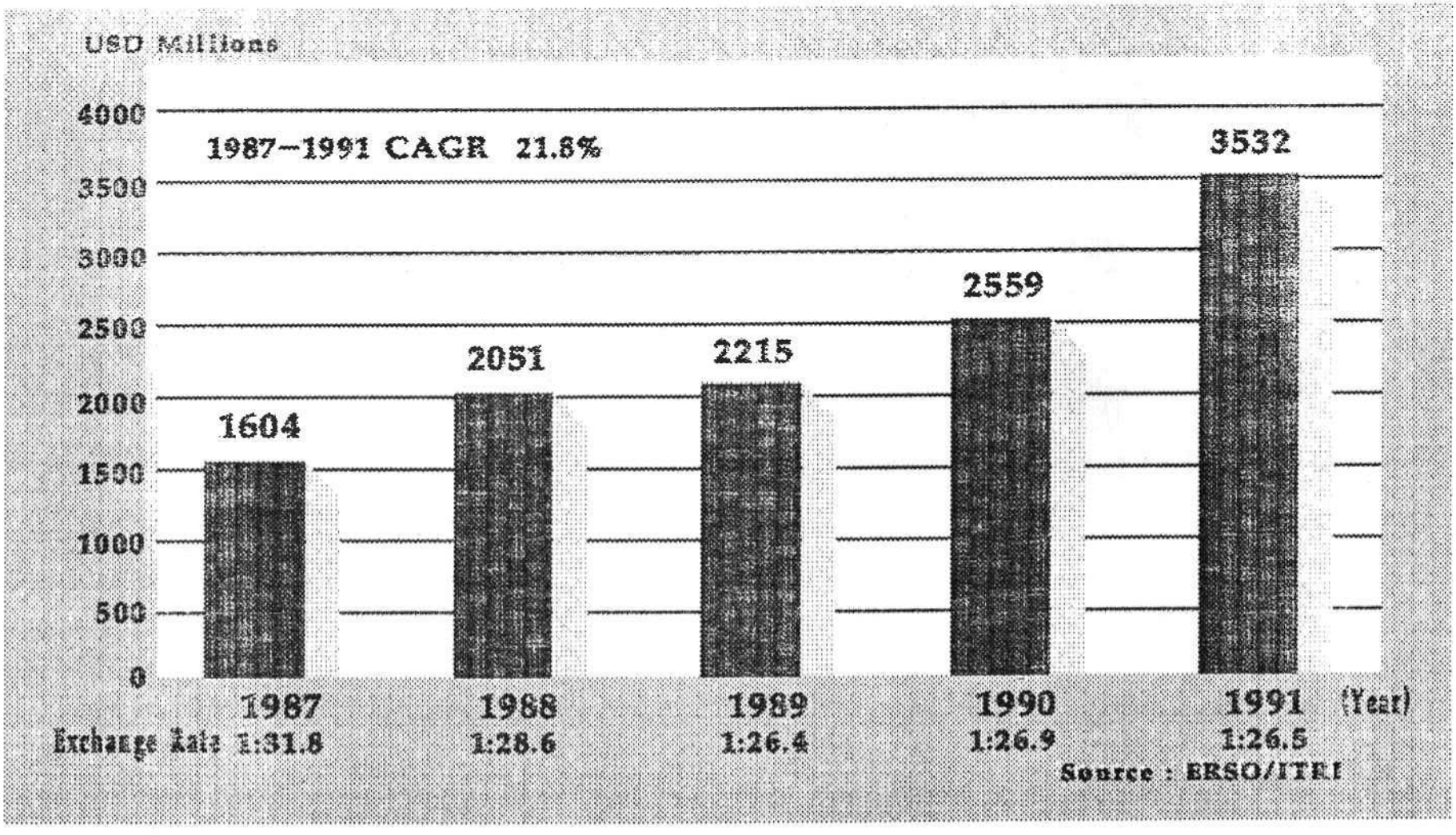
2.2	7.2	8.5	11.8	15.6	22.5	46.3	76.7	73.9	73.2	72.4	82.4

Exchange rate (to USD)

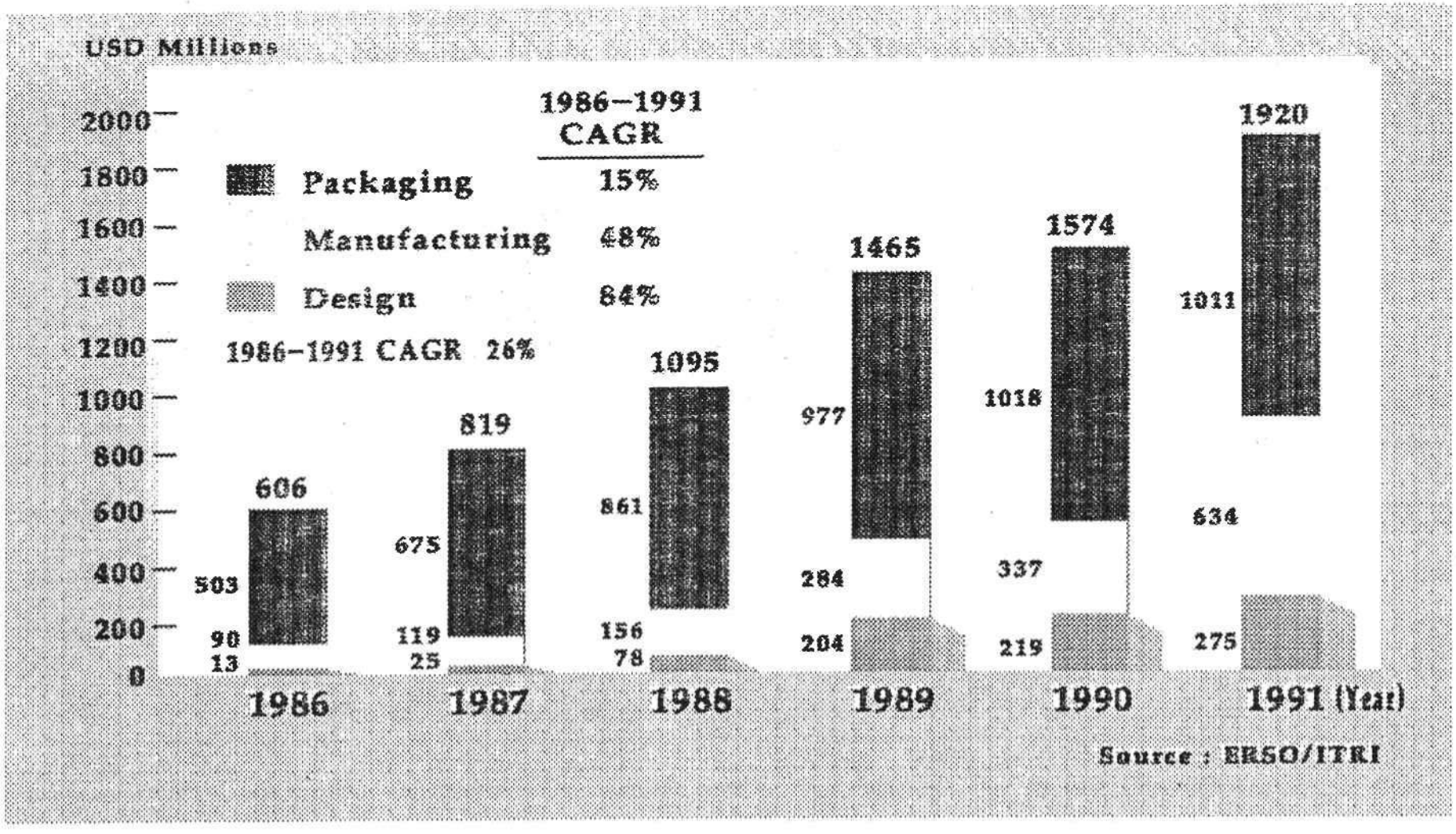
36.0	37.8	39.9	40.3	39.5	39.9	35.5	28.6	27.2	26.2	27.1	26.7

Source : DGB,Taiwan

TAIWAN DOMESTIC IC MARKET



TAIWAN IC INDUSTRY PRODUCTION

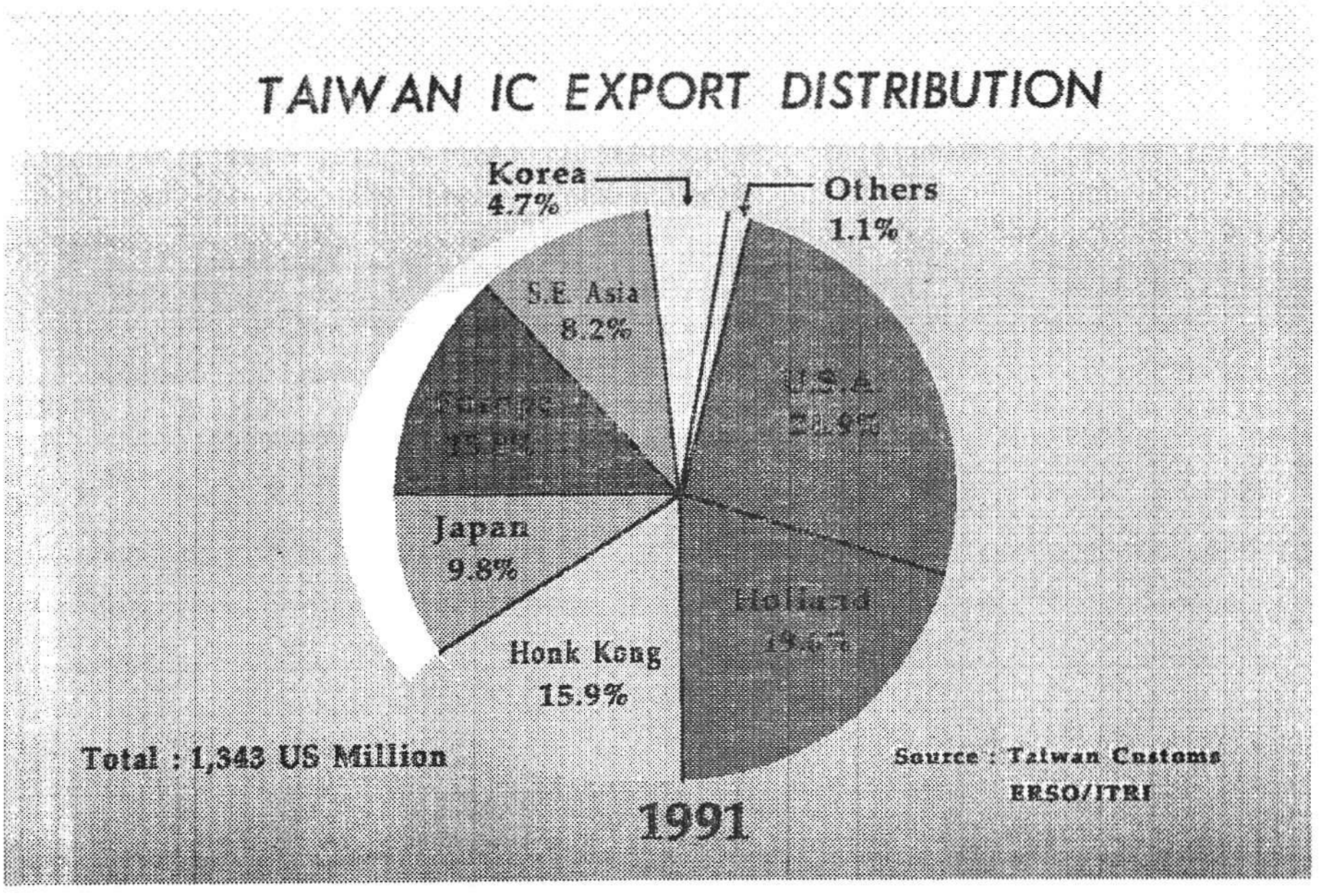


TAIWAN IC IMPORTS

	1986	1987	1988	1989	1990	1991
Japan	44.8%	38.7%	41.2%	39.6%	34.6%	26.4%
U.S.A.	23.7%	28.0%	26.8%	30.0%	30.2%	35.0%
S.E. Asia*	13.5%	14.5%	13.5%	10.4%	15.5%	18.9%
Korea	5.5%	5.9%	7.1%	8.2%	6.6%	8.2%
Hong Kong	5.6%	5.8%	5.9%	5.6%	6.4%*	5.6%
Europe	3.6%	3.3%	2.5%	2.8%	3.5%	3.1%
Others	3.3%	3.8%	3.0%	3.4%	3.2%	3.4%

Source: ERSO/ITRI

* Imports from Japan and U.S.A. assembly Houses or warehouses in S.E. Asia and Hong Kong

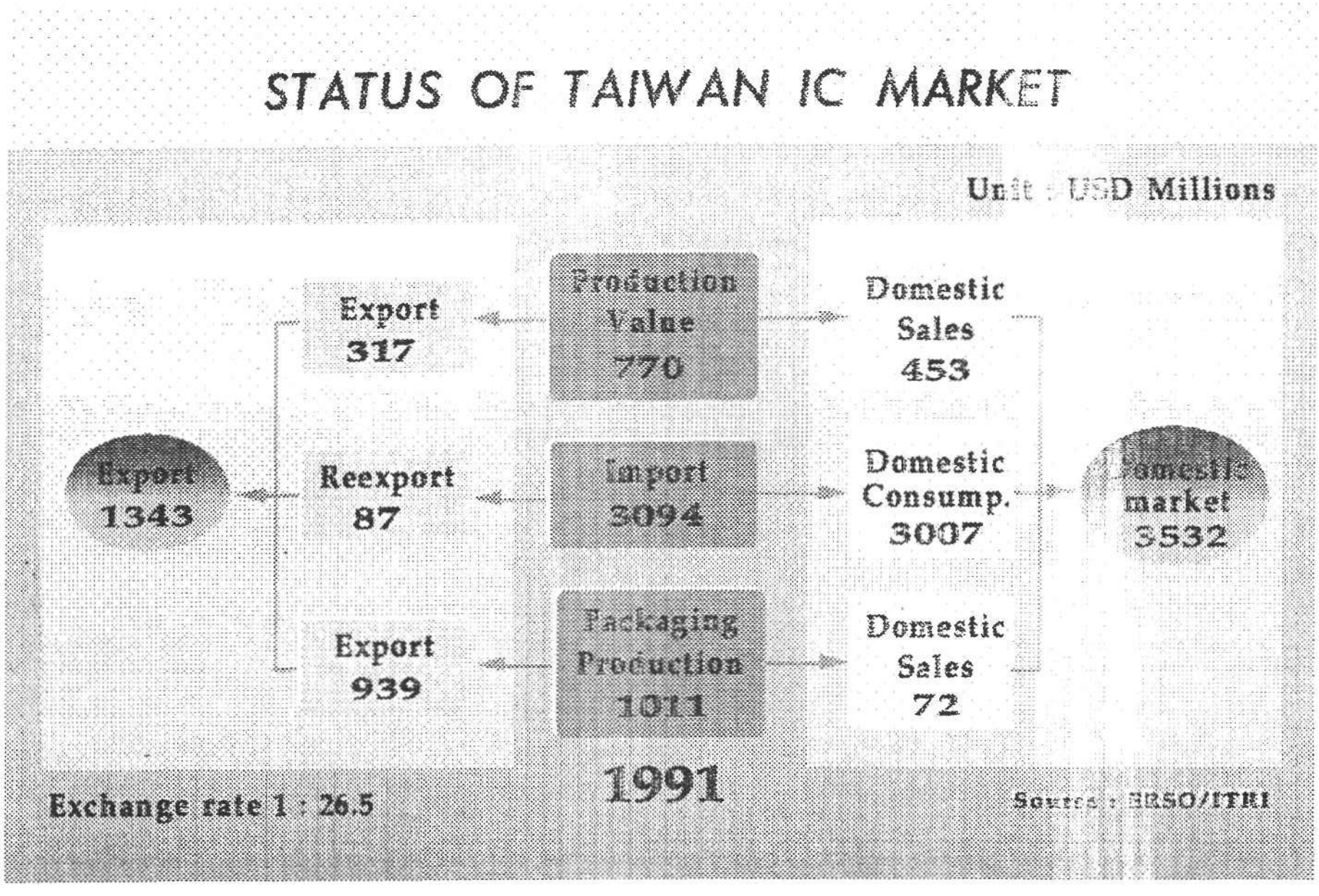


TAIWAN IC SALES DISTRIBUTION

PRODUCT \ YEAR	1985	1986	1987	1988	1989	1990	1991
CONSUMER	49%	30%	23%	17%	19%	28%	22%
COMMUNICATION	15%	31%	19%	15%	13%	16%	6%
COMPUTER/PERIPHERAL	19%	23%	38%	40%	15%	11%	14%
MEMORY	*	*	*	*	23%	24%	26%
CUSTOM DESIGN IC	3%	8%	9%	9%	2%	0%	8%
FOUNDRY	14%	8%	11%	19%	28%	21%	24%
TOTAL	100%	100%	100%	100%	100%	100%	100%

* Counted as Computer/Peripheral before 1989

Source : ERSO/ITRI



TOP FOUR TAIWAN IMPORTS

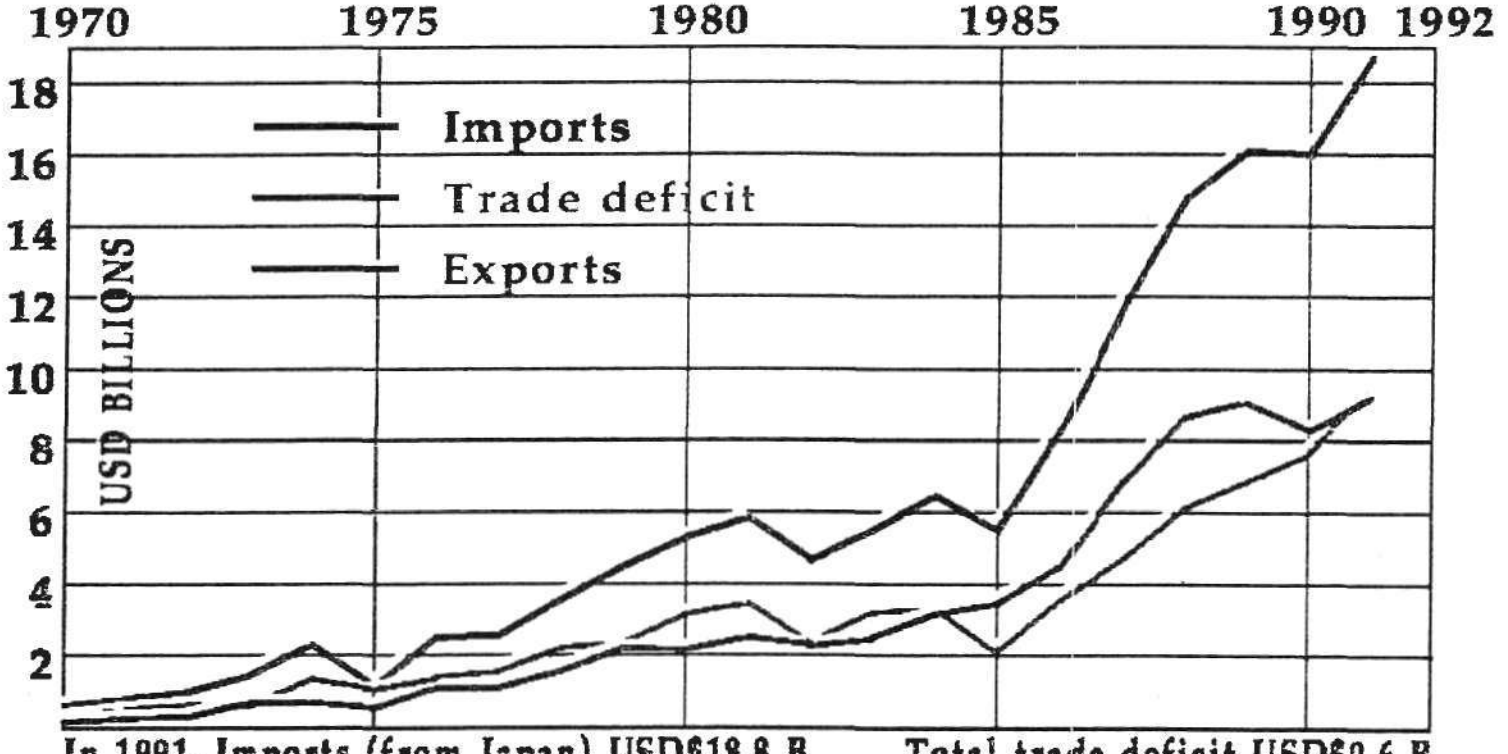
Unit : USD Billions

RANK	1990		1991	
	ITEM	AMOUNT	ITEM	AMOUNT
1	CRUDE OIL	2.95	ICs & MICROASSEMBLIES *	3.52
2	ICs & MICROASSEMBLIES	2.72	CRUDE OIL	3.26
3	AUTOMOBILES	1.42	MACHINES & MECHANICAL APPLIANCES	1.40
4	GOLD	1.34	GOLD	1.21

NOTE : ICs represent 85% of ICs & Microassemblies.

Source : Taiwan Customs

TAIWAN TRADE DEFICIT WITH JAPAN



In 1991, Imports (from Japan) USD$18.8 B
Exports (to Japan) USD$ 9.2 B
IC imports (from Japan) USD$930 M
IC exports (to Japan) USD$162 M

Total trade deficit USD$9.6 B
IC trade deficit USD$768 M
(8% of total trade deficit)

Source: DGB, Taiwan

GOVERNMENT SUPPORT

1. TAX INCENTIVES

2. R&D GRANTS

3. SUBMICRON CONSORTIUM

4. NANO DEVICE LABORATORY

ITRI's SUBMICRON CONSORTIUM

Objective : Develop and transfer leading edge process technology to Taiwanese IC industry.

Duration : July 1990 to 1995

Roadmap :

	1992	1995
Technology	0.7μ	0.5μ
Vehicles	4M DRAM/1M SRAM	16M DRAM/4M SRAM

Budget : US$ 260 Million

Industry Members : TSMC, UMC, Winbond, Mosel, Macronix, Holtek.

N.C.T.U.'s NANO DEVICE LAB

Objective : Develop leading edge module process technology to support Submicron Consortium and serve as an academic semiconductor research center.

Duration : 1990–1998

Roadmap :

	1992	1995	1998
Technology (Module)	**0.35μ**	**0.25μ**	**0.1μ**

Budget : US$ 40 Million

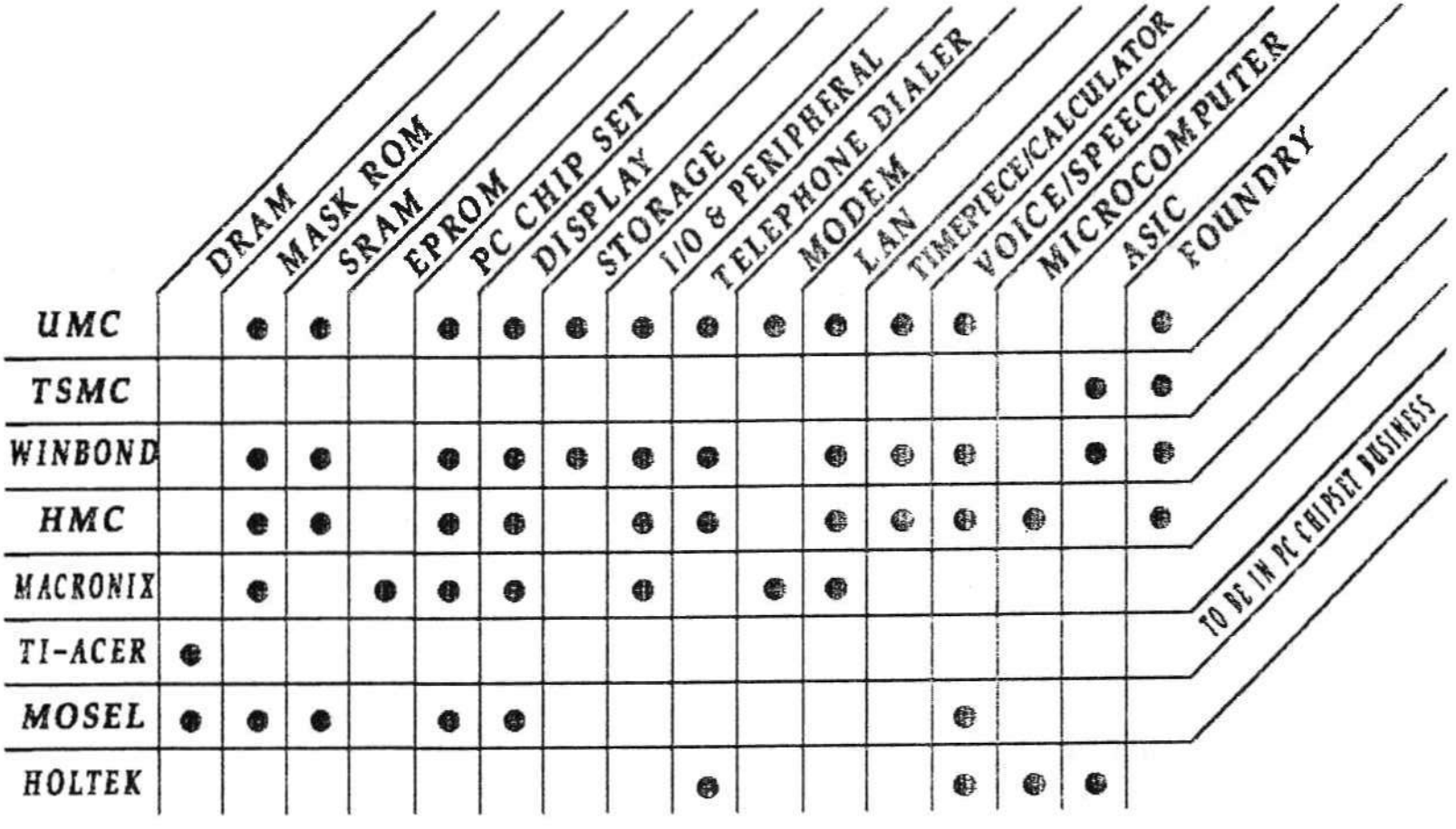
TAIWAN WAFER FAB CAPACITY FORECAST

Unit: wafer out/month

COMPANY	FAB	WAFER SIZE	1991	1992	1993	1994	TOTAL
UMC	I	4"	45K				45K
	II	6"	15K	+11K			26K
TSMC	I	6"	14K				14K
	II	6"	20K	+20K			40K
WINBOND	I	5"	20K				20K
	II	6"		+15K		+15K	30K
HMC	I	5"	30K				30K
MACRONIX	I	6"	15K		+15K		30K
TI-ACER	I	6"	12K		+12K		24K
MOSEL*	I	6"		+15K			15K
HOLTEK	I	5"	10K				10K
TOTAL	11	4"	45K				45K
		5"	60K				60K
		6"	76K	61K	27K	15K	179K

NOTE : * MOSEL AND VITELIC MERGED IN 1991.

TAIWAN IC PRODUCTS



TAIWAN IC MARKET SHARE TREND

Unit : USD Billions

ITEMS	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
WORLDWIDE MARKET	18.3	22.7	29.1	41.3	46.0	47.3	54.1	64.2	75.5	83.9	89.8
WORLDWIDE GROWTH RATE	-12%	24%	28%	42%	11%	3%	14%	19%	18%	11%	7%
TAIWAN SALES	0.062	0.12	0.18	0.25	0.38	0.45	0.90	1.35	1.8	2.22	2.74
TAIWAN GROWTH RATE	24%	94%	50%	39%	52%	18%	100%	50%	33%	23%	23%
TAIWAN MARKET SHARE	0.34%	0.53%	0.61%	0.61%	0.80%	0.95%	1.66%	2.10%	2.38%	2.64%	3.05%

	CAGR (1985 - 1990)	CAGR (1990 - 1995)
WORLDWIDE	21%	13.5%
TAIWAN	48.5%	43.5%

Source : Dataquest

SEMICONDUCTOR PRODUCTION BY COUNTRY

Unit : USD Billions

1985	
Country	Amount
Japan	$ 12.7
U.S.	$ 10.7
Germany	$ 1.2
S. Korea	$ 0.6
France	$ 0.6
Netherlands	$ 0.5
Great Britain	$ 0.4
Italy	$ 0.2
Israel	$ 0.1
Taiwan	$ 0.04
Others	$ 0.1
TOTAL	$ 27.1

1991	
Country	Amount
Japan	$ 32.0
U.S.	$ 25.3
Germany	$ 2.8
S. Korea	$ 2.3
France	$ 1.5
Netherlands	$ 1.5
Great Britain	$ 1.3
Taiwan	$ 0.9
Italy	$ 0.6
Israel	$ 0.5
Singapore	$ 0.2
Others	$ 0.6
TOTAL	$ 69.5

Source: Dataquest (Feb. 1992)

CHARACTERISTICS OF TAIWAN IC INDUSTRY

1. Higher growth rate than industry average.

   Taiwan 43% / Worldwide 13%

2. Small/Medium scale companies, many me-too products.

3. Vertical disintegration

   (Design house+FAB+Mask house+Assembly house)

4. New technologies developeded by overseas chinese technologists.

5. Domestic IC consumption USD $3.5 Billions

   90% imported (mainly from Japan and U.S.A.)

6. Most IC companies located in science-based industrial park.

7. Mainly for Taiwan, Hong Kong, Korea and Singapore markets.

PRODUCTION OF TAIWAN INFORMATION INDUSTRY

Unit : USD Millions

ITEMS	1986	1987	1988	1989	1990	1991	1992 (FORECAST)	1986-1991 CAGR
MICROCOMPUTERS	456	868	1295	1398	1566	1900	2093	33.0
DISK DRIVES	72	99	116	102	72	61	80	-3.2
PRINTERS	41	48	38	35	25	18	20	-15.2
TERMINALS	318	417	508	462	379	255	249	-4.3
MONITORS	500	849	1092	1317	1612	1950	2223	31.4
OTHER PERIPHERALS *	46	85	88	104	272	483	722	60.2
MICROCOMPONENTS **	701	1473	2034	2066	2223	2241	2207	26.1
TOTAL	2134	3839	5171	5484	6149	6908	7594	26.5

NOTE : * INCLUDING IMAGE SCANNER,MOUSE.
** INCLUDING MOTHERBOARD,DISPLAY CARD,POWER SUPPLY AND KEYBOARD.

Source : III

KEY INDICES OF TAIWAN INFORMATION INDUSTRY

Unit : USD Millions

ITEMS	1985	1986	1987	1988	1989	1990	1991
1. TOTAL PRODUCTION *	1,260	2,134	3,839	5,171	5,484	6,149	6,908
WORLDWIDE MARKET SHARE	1.0	1.5	2.4	3.1	3.0	3.0	3.0
WORLDWIDE RANKING	9	7	7	6	6	6	7
2. EXPORTS OF INFORMATION INDUSTRY	1,220	2,063	3,701	4,999	5,244	5,873	6,546
% OF TOTAL ELECTRONIC EXPORTS	24.9	29.9	35.0	38.2	38.0	40.3	41.2
% OF TOTAL EXPORTS	3.9	5.2	6.9	8.5	8.1	9.1	8.9
RANK OF TAIWAN INDUSTRIES (BY EXPORT VALUE)	11	7	4	3	3	3	3
3. ELECTRONICS INDUSTRY	6,300	8,300	13,000	15,500	16,700	17,240	19,000
% OF ELECTRONICS INDUSTRY	20.0	25.7	29.5	33.3	32.8	35.6	35.5

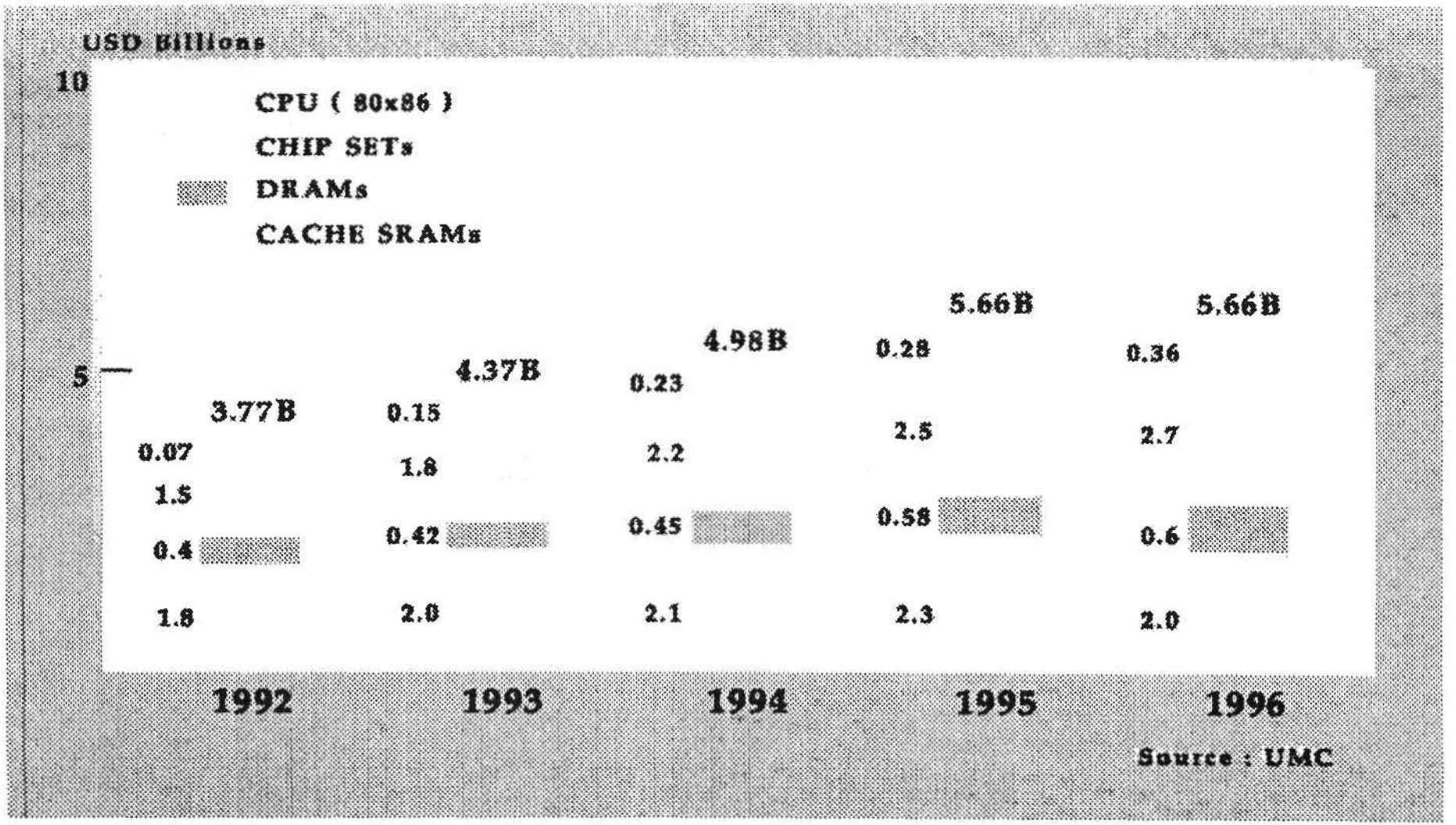
NOTE : * HARDWARE ONLY

Source : III

COMPARISON OF PC INDUSTRY IN JAPAN AND TAIWAN

Japan	Taiwan
• NEC 9800 series	• IBM PC clones
• Japanese characters	• English and chinese characters
• Compact design	• Desk-top,add-on cards,starting note book size
• Conglomerate producers	• Medium/Small makers
• Domestic component supply	• Key components imported from Japan and U.S.A.
• Large volume production and few models	• Flexible,medium/small volume production for a variety of models
• Long development TAT for new models	• Fast design/development/production cycle times
• Mainly for domestic market	• 90% exported
• Self brand names & few OEMs	• OEM majority & some self brands

PERSONAL COMPUTER IC SALES PROJECTIONS



STRENGTH OF TAIWAN IC INDUSTRY

1. Good engineers and innovative designers
2. Entrepreneurship
3. Government support
4. Ample funding
5. Industry infrastructure
6. In-country IC self-support system

WEAKNESS OF TAIWAN IC INDUSTRY

1. Technology

2. System applications

3. Intellectual property

4. Sales / Marketing

TAIWAN —— IDEAL PARTNER WITH JAPANESE IC COMPANIES

- **Supply of engineers and talented innovative people**
- **Strong government support, tax incentives, R/D grants**
- **Easy access to East Asia economic common market**
- **Adaptive production technology**
- **High efficiency, good quality manufacturing expertise**
- **Excellent capital raising opportunities**
- **Efficent product design capability esp. PC and LAN**
- **Best infrastructure after Japan and U.S.A.**
- **Fast growing, prosperous local market demand**
- **Strong software, CAD capability**

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a company of
The Dun & Bradstreet Corporation

Foreign-Based Companies' Perspective on International Partnerships

Sachiaki Nagae
Representative Director and President
Texas Instruments Japan, Ltd.

Mr. Nagae is Representative Director and President of Texas Instruments Japan. Since joining Texas Instruments Japan in 1967, he has held various manufacturing and management positions including Manager of Bipolar Products at the Hiji Plant and Manager of MOS Logic Products at the Hatogaya Plant. In 1986, he became Director of Texas Instruments Japan. In 1987, he was named Deputy Manager, Japan Semiconductor Group, and Vice President, Semiconductor Group, Texas Instruments Incorporated. He was appointed to his present position in 1990. Mr. Nagae holds a B.E. degree in Electric Communication from Tokyo Electric University.

Dataquest Incorporated
JAPANESE SEMICONDUCTOR INDUSTRY CONFERENCE
April 13-14, 1992
Tokyo, Japan

Foreign-Based Companies' Perspective on International Partnerships

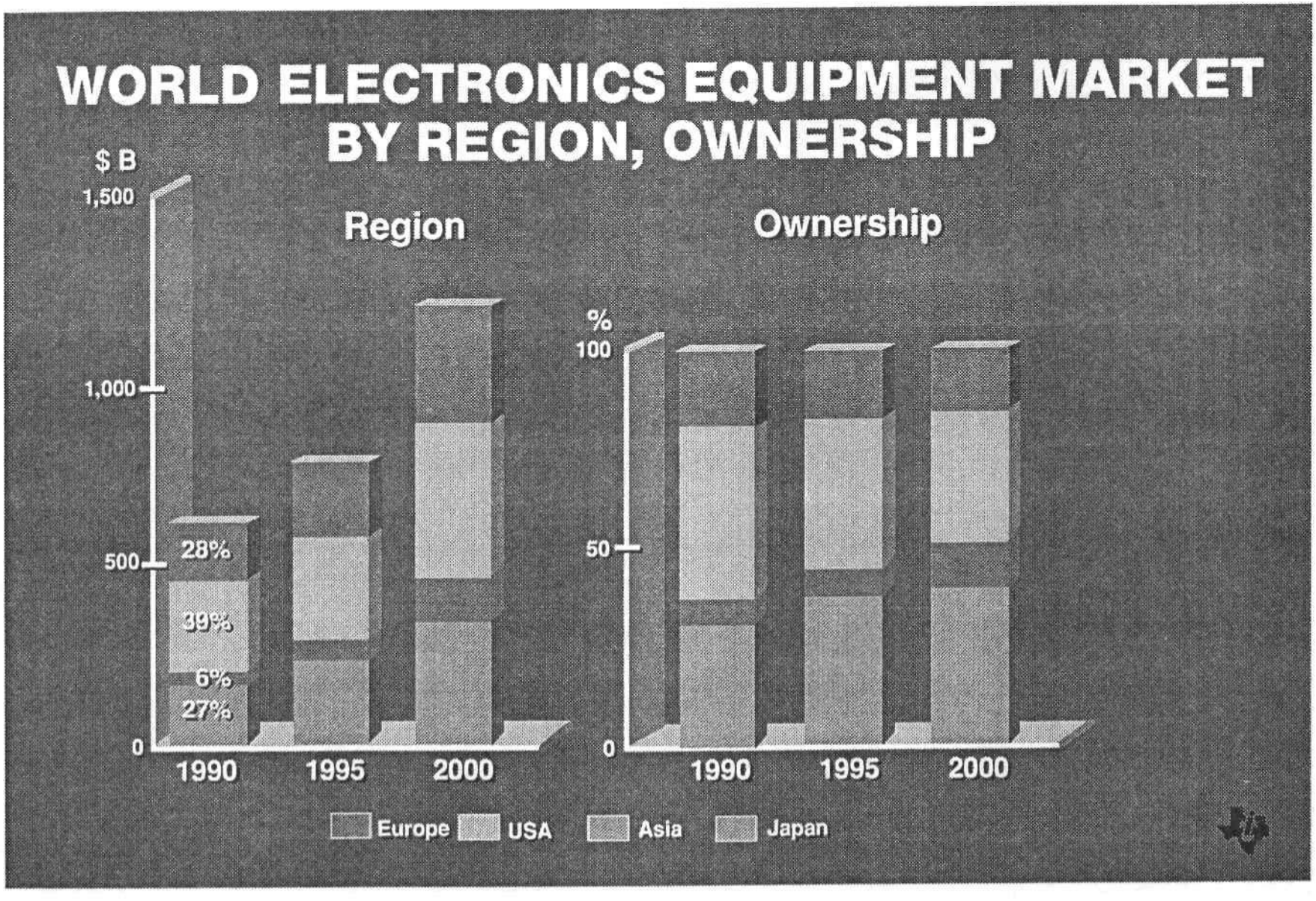
Sachiaki Nagae
Representative Director and President
Texas Instruments Japan, Ltd.

GLOBAL ENVIRONMENT IN THE '90s

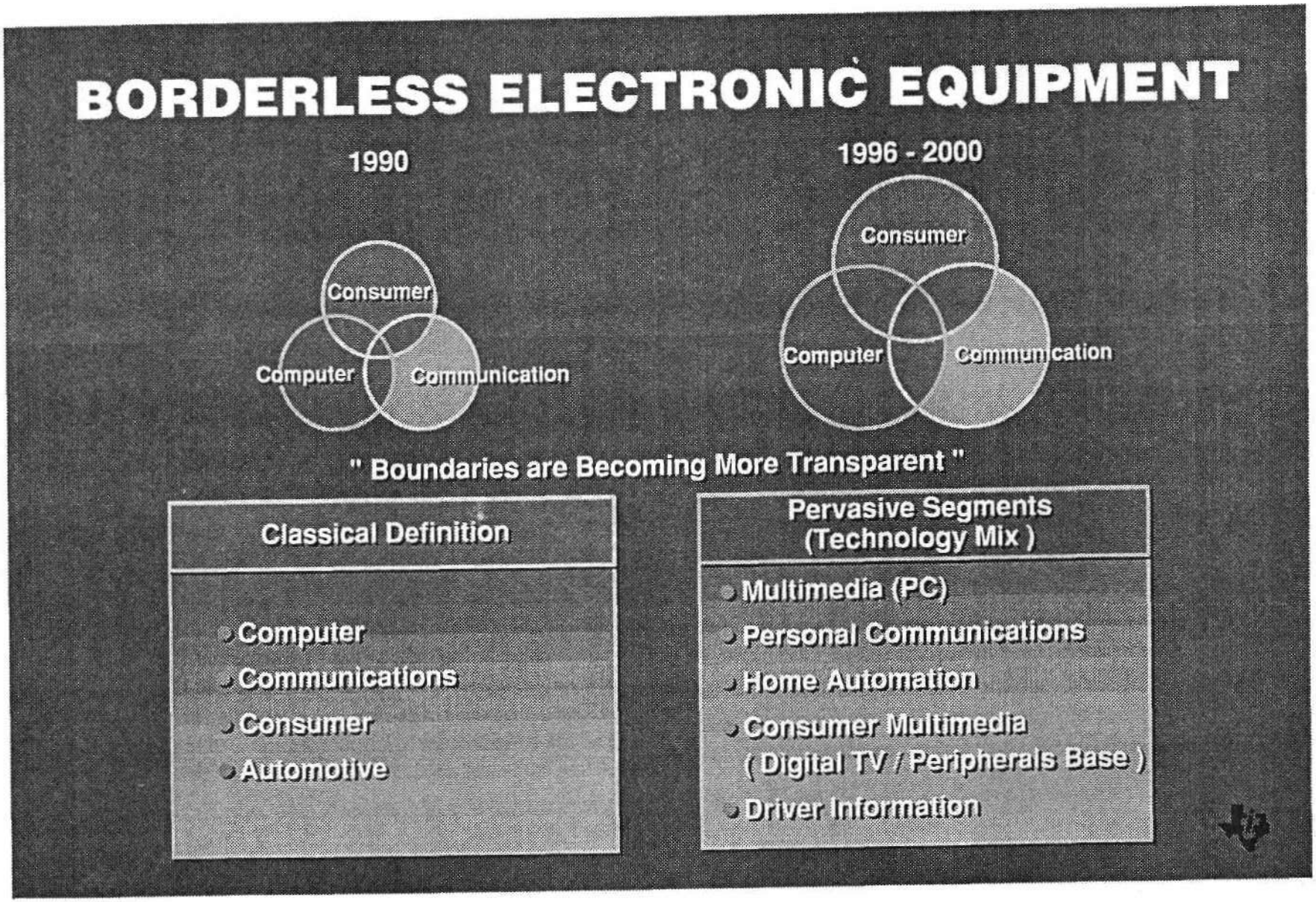
Customer Success

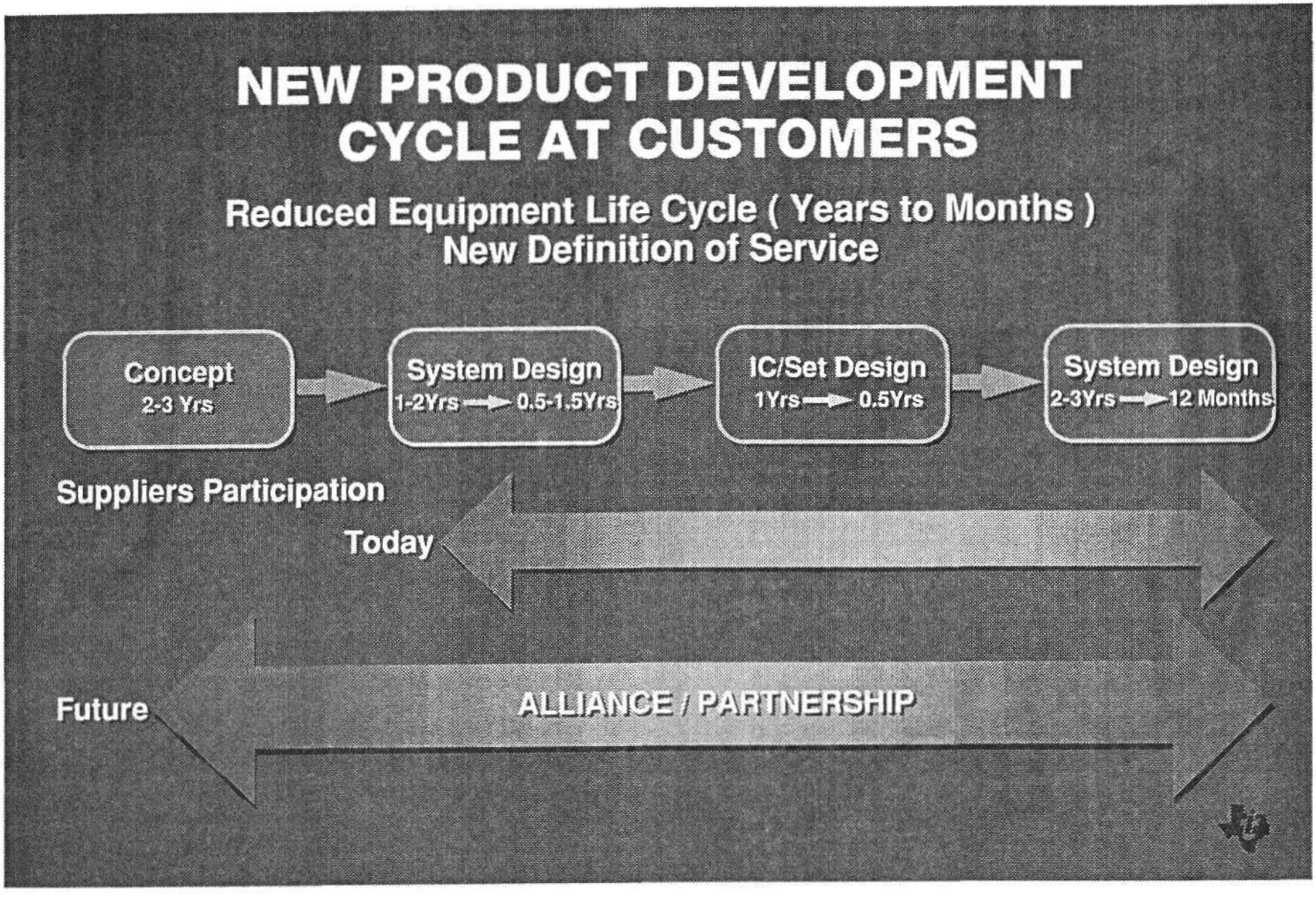
- Alliance
- Partnership

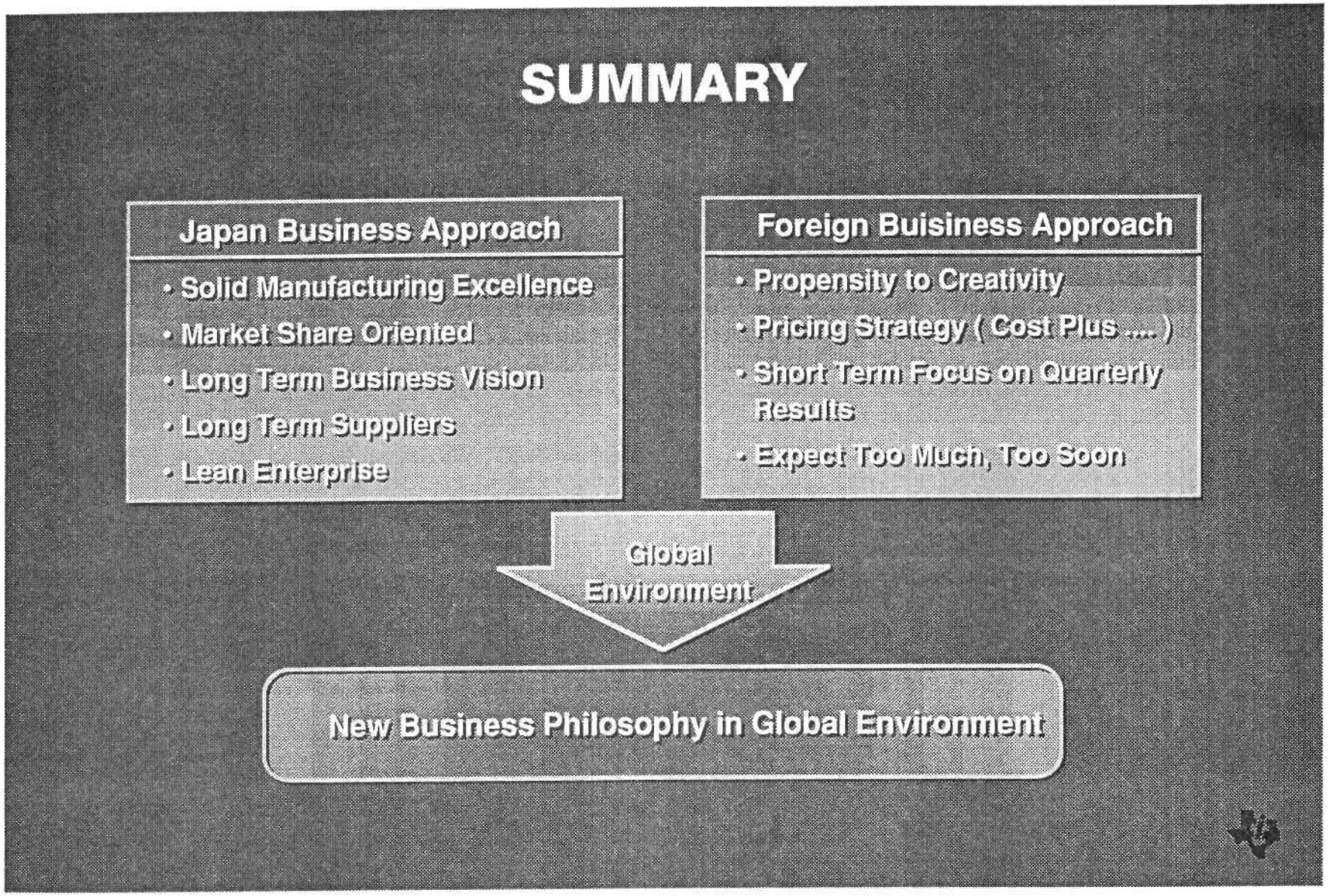
- Advanced Leadership Technology
- Global Strategy
- Global Infrastructure
- Local Market Support



BORDERLESS ELECTRONIC EQUIPMENT







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Global Partnerships between Semiconductor Equipment and Devices in the 1990s

Akira Inoue
President and CEO
Tokyo Electron Limited

Mr. Inoue is President and Representative Director of Tokyo Electron Limited (TEL). Mr. Inoue Joined Tokyo Electron in 1978 and has held various management positions including Manager of SPE-2 Department (semiconductor process equipment), Director, and Senior Managing Officer. He was appointed to his current position in December 1990. Prior to TEL, Mr. Inoue was employed by Nisso K.K. for 12 years, 6 of which were spent working in New York. Later he transferred to Tokyo Process Development Co.,Ltd. and served as President for 6 years. Mr. Inoue holds a B.E. degree in Mechanical Engineering from Keio University.

Dataquest Incorporated
JAPANESE SEMICONDUCTOR INDUSTRY CONFERENCE
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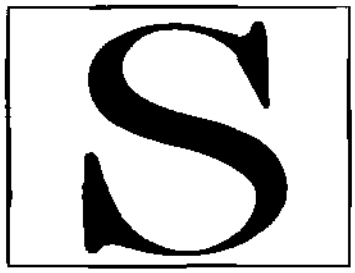


Global Partnerships between Semiconductor Equipment and Devices in the 1990s

Akira Inoue
President and CEO
Tokyo Electron Limited

半導体製造装置からデバイスまでの

グローバル・パートナーシップ

東京エレクトロン株式会社
代表取締役社長　井上　皓

APRIL 14, 1992

AGENDA

1. グローバル・パートナーシップの現状
   - （ｉ） 事業展開の内容
   - （ii） 具体的パートナーシップ
   - （iii） パートナーシップの事業内容
2. グローバル・パートナーシップの成果
3. グローバル・パートナーシップ展開に於ける注意事項
4. 総論

1. グローバル・パートナーシップの現状

（ｉ）事業展開の内容

(a) 参画業界：半導体産業とコンピュータ産業

(b) 業務内容：半導体製造装置（ＳＰＥ）、電子部品（ＥＣ）
コンピュータ・システム（ＣＳ）、ＴＦＴ－ＬＣＤ（ＬＣＤ）

(c) 組織形態：２つの顔

★商社の顔（ＴＥＬ）；グループ全体の事業戦略、研究開発、
製品企画及び他社製品も含む営業が主業務

★メーカーの顔（ＴＥＬグループ）；集約化された事業分野
に於いて開発・製造が
主業務

東京エレクトロン相模株式会社
東京エレクトロン山梨株式会社
東京エレクトロン九州株式会社
東京エレクトロン東北株式会社
東京エレクトロン佐賀株式会社
東京エレクトロン札幌株式会社
テル・バリアン株式会社

★これらの事業をスムーズに展開するための関連会社を含め、
東京エレクトロン・グループは従業員約５，０００名、
関連会社１５社より構成されております。

（ii）具体的なパートナーシップ

SPE事業部

KLA	15年
VARIAN	14年
TENCOR	7年
FUSION	9年
SEMITOOL	5年
その他	

EC事業部

WESTERN DIGITAL	20年
EXAR	16年
MITEL	12年
AMD	12年
VLSI	7年
MOTOROLA	6年
その他	

CS事業部

GEN－RAD	20年
CONVEX	7年
ICAD	5年
ULTRANET	4年
その他	

（iii）パートナーシップの業務内容

VARIAN社の例　VARIAN社製品；イオン打込装置、スパター装置
TEL製品　；拡散炉、LP－CVD炉
エッチャー、コータ／デベロパー

（ミラーイメージ）

日本市場

(a) TELによるVARIAN社製品の輸入、販売、及び据付、メインテナンス、アフターサービス

(b) お客様対応、仕様等強固な支援の為のJOINT'－VENTURE

TEL－VARIAN LTD.
AT NIRASAKI

アメリカ・ヨーロッパ市場

(a) VARIAN社によるTEL製品の輸入、販売、及び据付、メインテナンス、アフターサービス

(b) お客様対応、仕様等強固な支援の為のJOINT'－VENTURE

VARIAN－TEL LTD.
AT CALIFORNIA

ＫＬＡ社の例

ＫＬＡ社製品；ウェハー検査装置、
マスク／レティクル検査装置
ＴＥＬ製品　；ウェハープローバー

（ミラーイメージ）

日本市場

(a) ＴＥＬによるＫＬＡ社製品の輸入、販売、及び据付、メインテナンス、アフターサービス

(b) お客様対応、仕様等強固な支援の為の組織

ＫＬＡ ＪＡＰＡＮ ＬＴＤ.
ＡＴ ＴＡＣＨＩＫＡＷＡ

アメリカ・ヨーロッパ市場

(a) ＫＬＡ社によるＴＥＬ製品の輸入、販売、及び据付、メインテナンス、アフターサービス

(b) お客様対応、仕様等強固な支援の為の組織

ＣＡＬＩＦ. ＴＥＣＨＮＯＬＯＧＹ
ＤＩＶ. ＯＦ ＴＥＬ
ＡＴ ＣＡＬＩＦＯＲＮＩＡ

以上２例の特色

1. 得意の分野に力を集約する事が出来る
2. 販売効率のアップ（各種製品の販売が可能）
3. 低コスト、低リスクによるグローバル展開
4. その他

ＡＭＤ社の例

日本市場

ＴＥＬはＡＭＤ社代理店としてＡＭＤ社製品を集約化されたグループ、
ＡＭＤ営業部にて輸入、技術力を基とした販売を行って居ります。
日本においてＮＯ．１の取扱い高、世界でＮＯ．３の取扱い高であります。

ＭＯＴＯＲＯＬＡの例

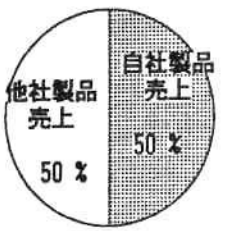
日本市場

ＴＥＬはＭＯＴＯＲＯＬＡ社の代理店としてＭＯＴＯＲＯＬＡ製品を
集約化されたグループ、ＭＯＴＯＲＯＬＡ営業部にて輸入、技術力を
基とした販売を行って居ります。
日本においてＮＯ．１の取扱い高、世界でＮＯ．２の取扱い高であります。

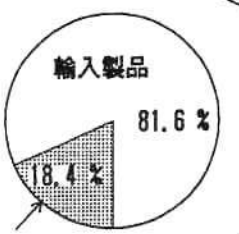
特色：
1. グローバルな半導体の動きを早く知る事が出来ます
2. 日本国内のお客様（システム）の動きを早く知る事が出来ます
3. 半導体事業全体の話が出来ます
4. その他

2. グローバル・パートナーシップの成果（１９９１年度）

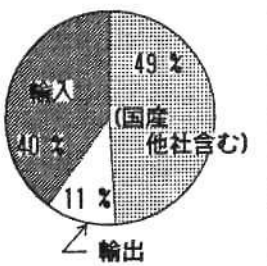
（ｉ）ＴＥＬの売上構成（自社／他社）



（ii）ＴＥＬの他社製品売上構成（輸入／国産）



（iii）ＴＥＬの売上全体構成（国産・輸入・輸出）



特記事項：

1）１９８３．６　宇野通産大臣より輸入拡大貢献企業表彰

2）１９８３．１１　米国商務省より輸入貢献企業に指定

3）１９９０．５　米国商務省よりコマーシャル・フレンドシップ企業に認定

4）１９９１．４　輸入拡大に貢献にて藍綬褒章を当社久保取締役相談役が受賞

3. グローバル・パートナーシップ展開における注意事項

（i） ＢＵＳＩＮＥＳＳに基づいたパートナーシップである事
（相互利益）

（ii） パートナー間に相互扶助の特色がある事
（技術力・マーケティング等）

（iii） 将来性・継続性があるＢＵＳＩＮＥＳＳがＢＥＴＴＥＲ
（夢を語る）

（iv） ともに見識ある人々であってもらいたい
（相手の立場に立って考える事）

（v） 忍耐強く知恵を出し合う事

（vi） その他

4. 総論

（ｉ）我々の思考様式

(a) 基本的にアメリカの市場は、アメリカのビジネスマンの市場である事、ＥＣの市場は、ＥＣのビジネスマンの市場である事、の認識が必要。

従い、アメリカ・ＥＣの市場に於いて、彼らに最大限の仕事をして戴く事を考え、又彼らが利益を上げ、人生をＥＮＪＯＹして戴く事を考える事が必要であります。

(b) 文化（思考様式・行動様式）の違いより生ずるリスクをＭＩＮＩＭＩＺＥする事の必要性。

特に、法律の違い、生活様式の違い、商習慣の違い等より、同国人に任せる事が必要と思います。

（ii）歴史的な考慮よりのパートナーシップ

(a) パックス・アメリカーナに対する御恩返し
(b) レーガノミックスによる恩恵
(c) ベトナム戦争に対する同情
(d) グローバルな自由貿易体制を一体どこの国が最も必要としているのか
(e) 再度アメリカが保護主義への道を選んだら、どのようになるか
(f) 基軸通貨のドルが暴落したらどうするのか
(g) アメリカが加工国より資本国へ転換したらどうなるのか
(h) その他

（iii） 総論

(a) 我々が国際社会の一員であるという事の自覚

(b) 日本の国際社会に於ける立場を理解し、
それに相応しい行動と意志を示す事

(c) 我々民間人は、あくまでＢＵＳＩＮＥＳＳとして
このグローバル・パートナーシップを取り上げる事

(d) 日本国民として長期的な視野に立ち、理性、徳性等
に基づく判断基準にて、グローバル・パートナーシップを
事業として展開する事

(e) 共存共栄を基本とする

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Strategic Alliances for Multimedia

Shigechika Takeuchi
Vice President, Apple Computer Inc.
President, Apple Japan, Inc.

Mr. Takeuchi is President of Apple Japan, Inc. He joined the company in March 1989 and became Vice President of Apple Computer Inc. in October 1990. Previously, he spent more than 20 years with Toshiba Corporation, including 5 years in Toshiba Europe and Toshiba America. Mr. Takeuchi joined Toshiba in 1968 as an Engineer in computer hardware and software and was a Deputy Manager in the Systems Engineering and Computer Planning Department. As Assistant General Manager of Toshiba America, he launched Toshiba's computer business in the United States. Mr. Takeuchi was involved in computer peripherals in the international operations section of the Information & Communications Division. He was also Senior Vice President and Group Executive for Toshiba Europe and was in charge of strategic corporate planning and computer division. Mr. Takeuchi graduated from Waseda University with a B.S. degree in Electronics and received an M.S. degree in Computer Science from the University of Minnesota.

Dataquest Incorporated
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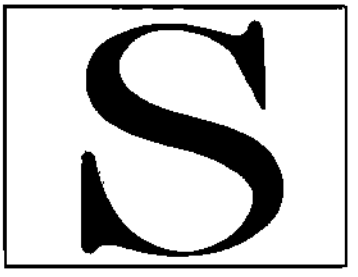

Strategic Alliances for Multimedia

Shigechika Takeuchi
Vice President, Apple Comuter Inc.
President, Apple Japan, Inc.

THIS PRESENTATION WAS NOT AVAILABLE AT

TIME OF PUBLICATION

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a company of
The Dun & Bradstreet Corporation

Overview of the Semiconductor Industry in the 1990s

William O. Howe
President
Intel Japan K.K.

Mr. Howe is President of Intel Japan and Vice President of the Sales and Marketing. He joined Intel in July 1979, as a Customer Marketing Engineer in the Memory Products Division. In 1981, Mr. Howe moved to Europe to assume the job of Regional Customer Marketing Manager. He later became Market Development Manager and Marketing Manager in Intel Europe before assuming the job of Marketing Manager for Intel Japan in 1985. Mr. Howe became President of Intel Japan in 1987 and was appointed Vice President of the Sales and Marketing Group in January 1990. Mr. Howe graduated form Waterloo University in Canada with a B.S. degree in Mathematics. He received an M.B.A. degree from Harvard University in 1979.

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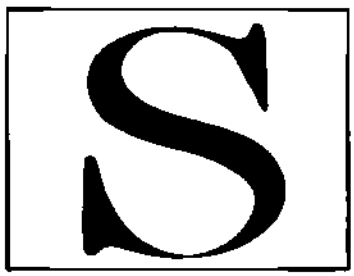

Overview of the Semiconductor Industry in the 1990s

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Memory Alliances: Steady State Solution or Prelude to Consolidation?

Lane Mason
Director and Principal Analyst
Dataquest Incorporated

Mr. Mason is Director and Principal Analyst for the semiconductor memory group of Dataquest. He is responsible for analyzing and forecasting trends in the DRAM market. Prior to rejoining Dataquest, Mr. Mason was founder of Viking Research, a market research company specializing in strategic alliances and DRAM research. As an independent consultant, he authored a number of newsletters and multiclient studies and undertook numerous research projects on DRAM technology issues. Mr. Mason has 14 years experience in memory IC research, having helped start Dataquest's memory research in 1978. He served as Dataquest's Senior Analyst for memory from 1981 to 1986. His early efforts established the databases that form the basis of Dataquest's current memory research. Mr. Mason earned his B.S. degree in Physics from the California Institute of Technology.

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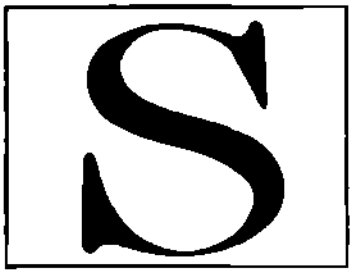


Memory Alliance: Steady Stated Solution or Prelude to Consolidation

Lane Mason
Director and Principal Analyst
Dataquest Incorporated

Strategic Alliances -- Steady State Solution or Prelude to Consolidation?

LANE MASON
Dataquest Incorporated

April 1992

PROGRAM

- The search for industry development insights
- The rise and role of strategic alliances
- Is the logic for SC industry concentration in place?
- The evolving motivations for industry consolidation
- How the "SA model" can postpone the inevitable

Strategic Alliances -- Steady State Solution or Prelude to Consolidation?

LANE MASON
Dataquest Incorporated

April 1992

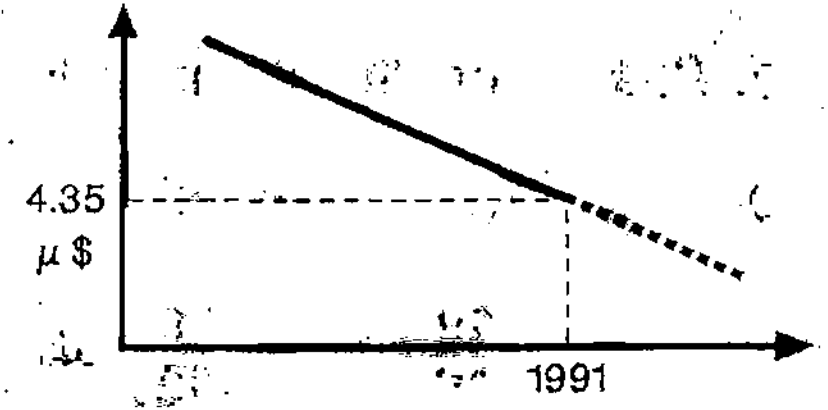
PROGRAM

- The search for industry development insights
- The rise and role of strategic alliances
- Is the logic for SC industry concentration in place?
- The evolving motivations for industry consolidation
- How the "SA model" can postpone the inevitable

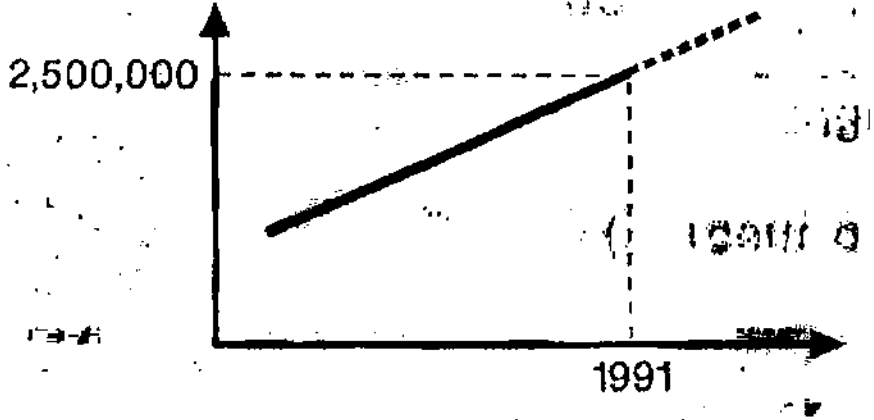
Consolidation Phase?!

Autos (1920s) 400 → 25

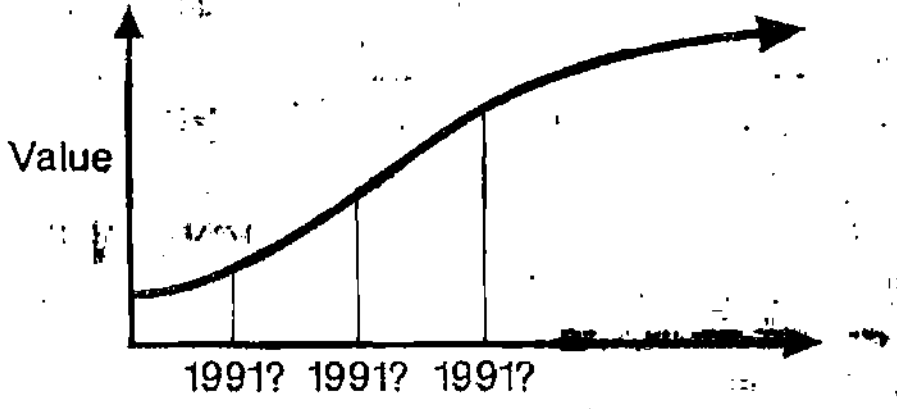
S/C (???) 300 → ??



DRAM Price per Bit



MPU Transistor Budget



Source: Dataquest

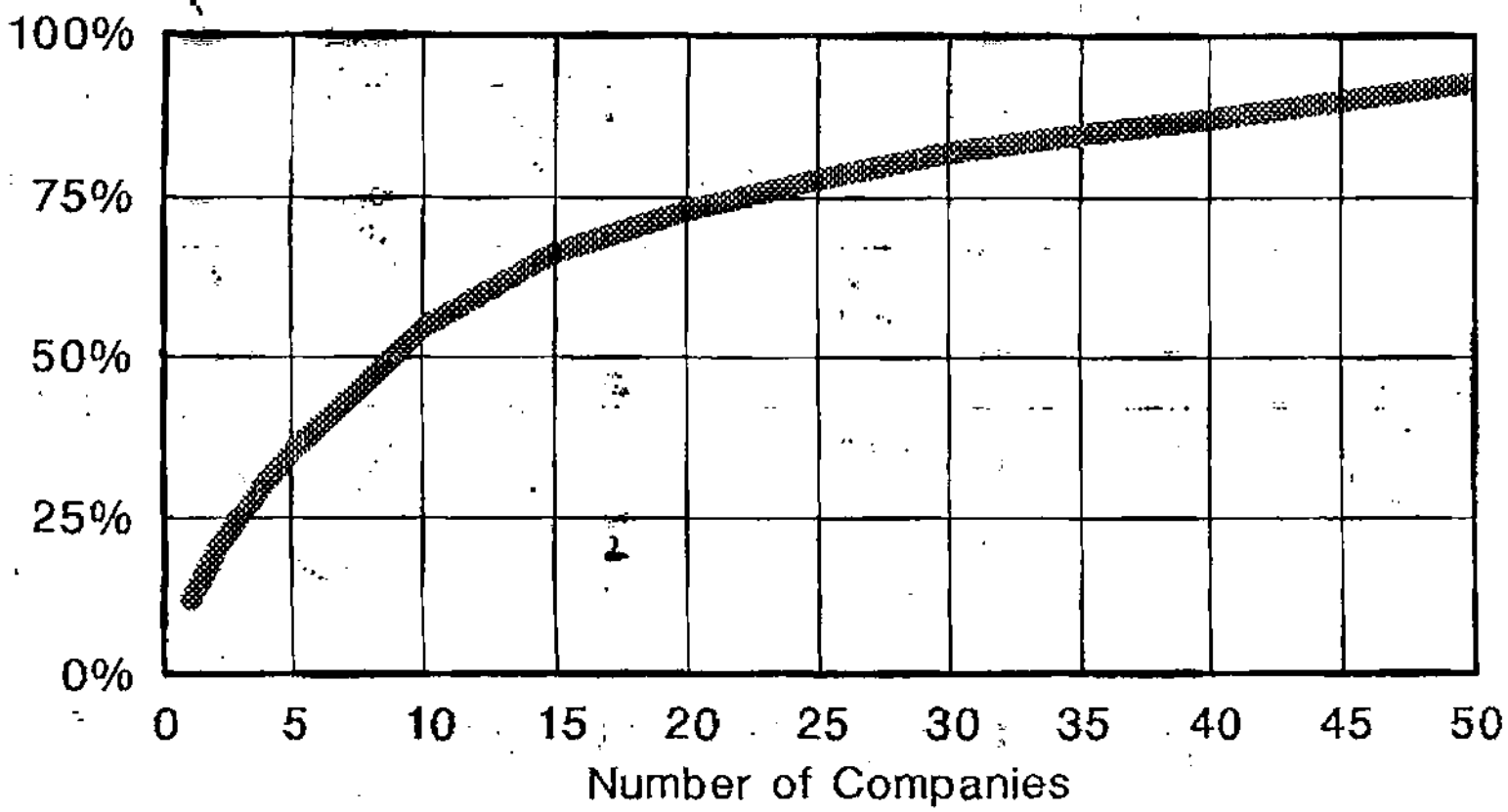
DRAM MARKET CONCENTRATION

(Percent of Total Market)

	1976	1980	1984	1989	1991
Top 1	26	19	15	17	14
Top 2	45	33	30	26	27
Top 5	84	66	65	53	55
Top 10	92	92	84	85	83
Suppliers	15	18	24	19	20
Total Market (Millions $)	$200	$1,030	$3,520	$8,600	$6,700

Source: Dataquest

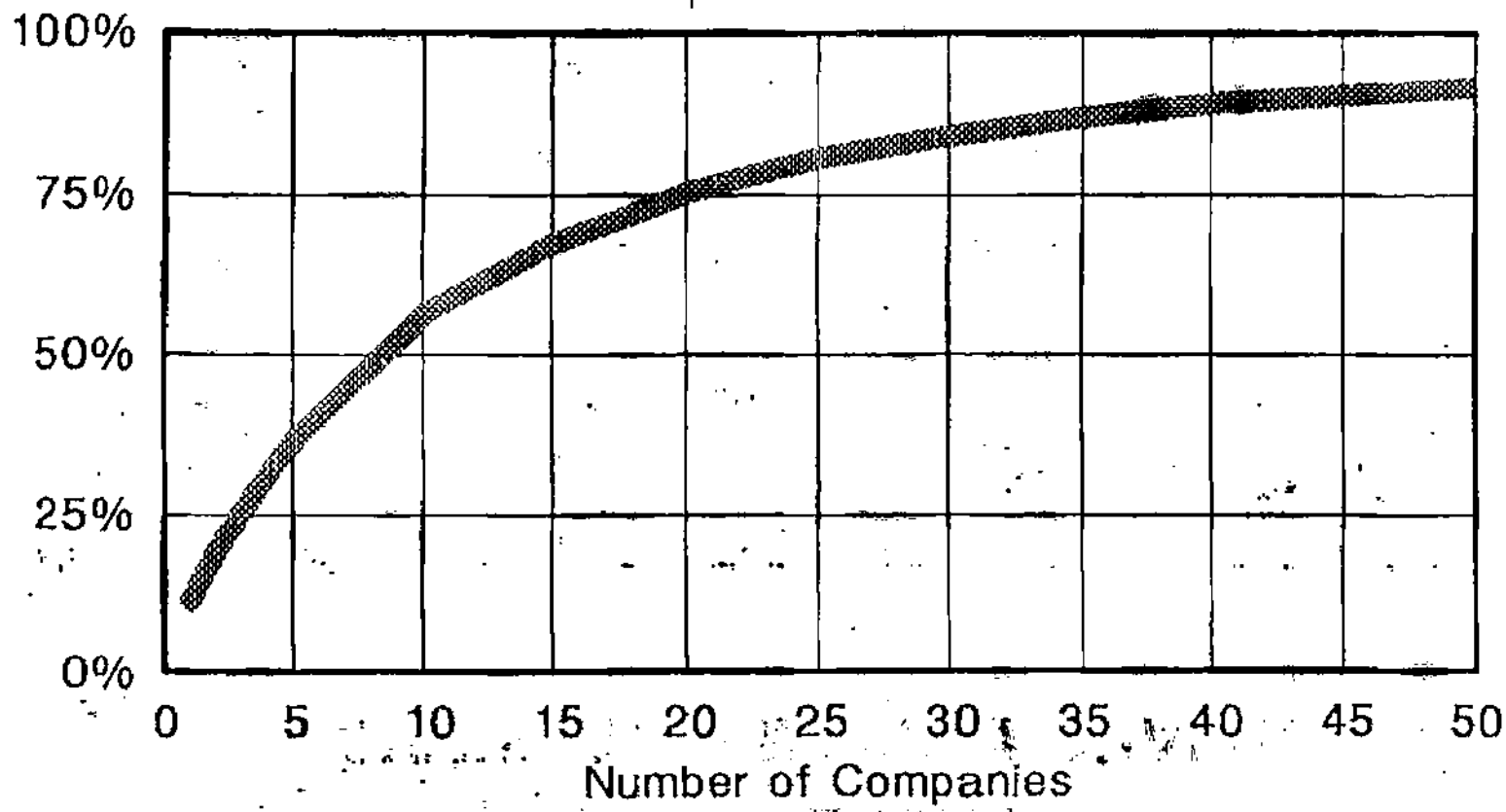
TOP PRODUCERS' CUMULATIVE MARKET SHARE 1975



Source: Dataquest

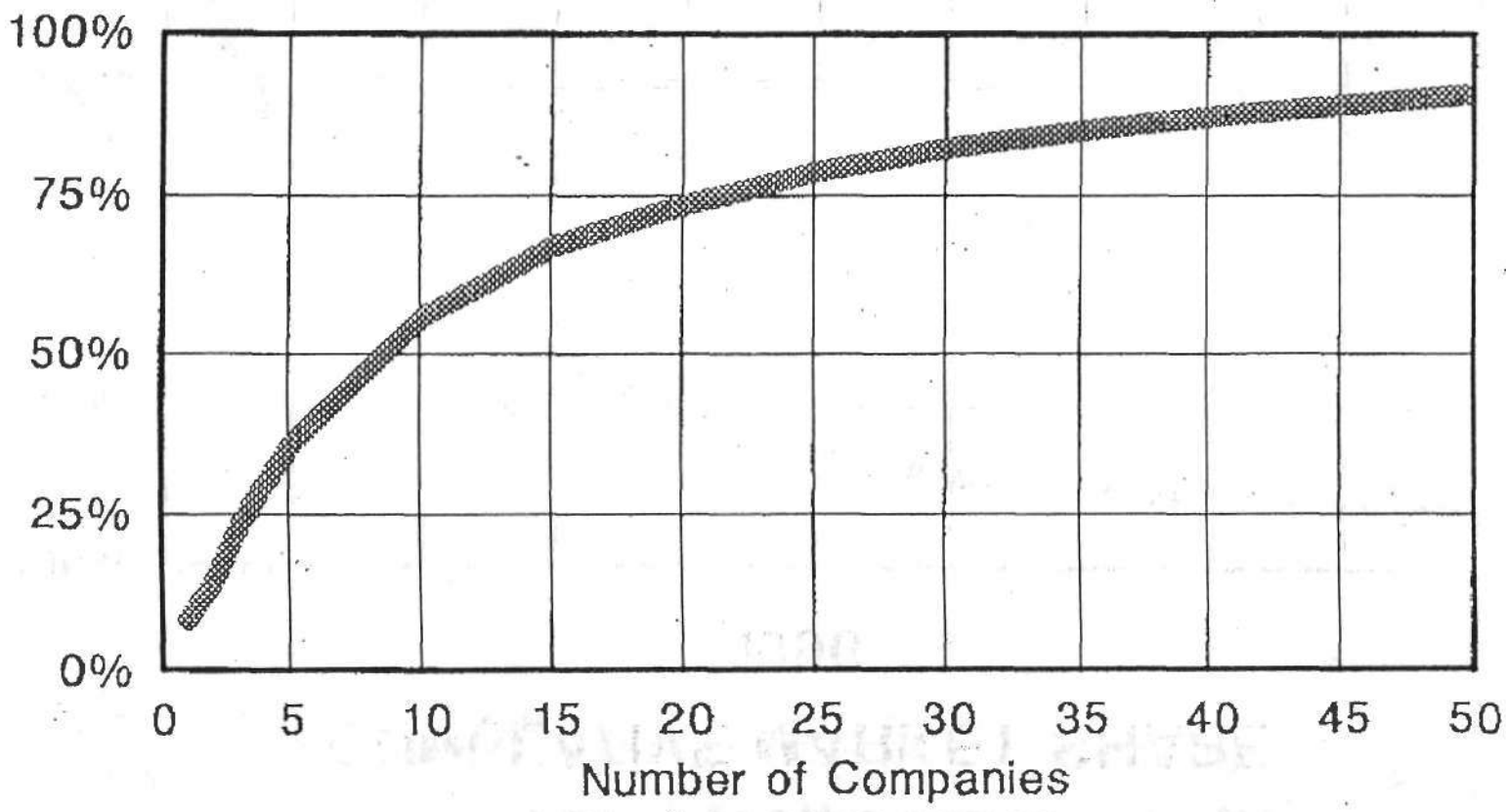
TOP PRODUCERS' CUMULATIVE MARKET SHARE

1980



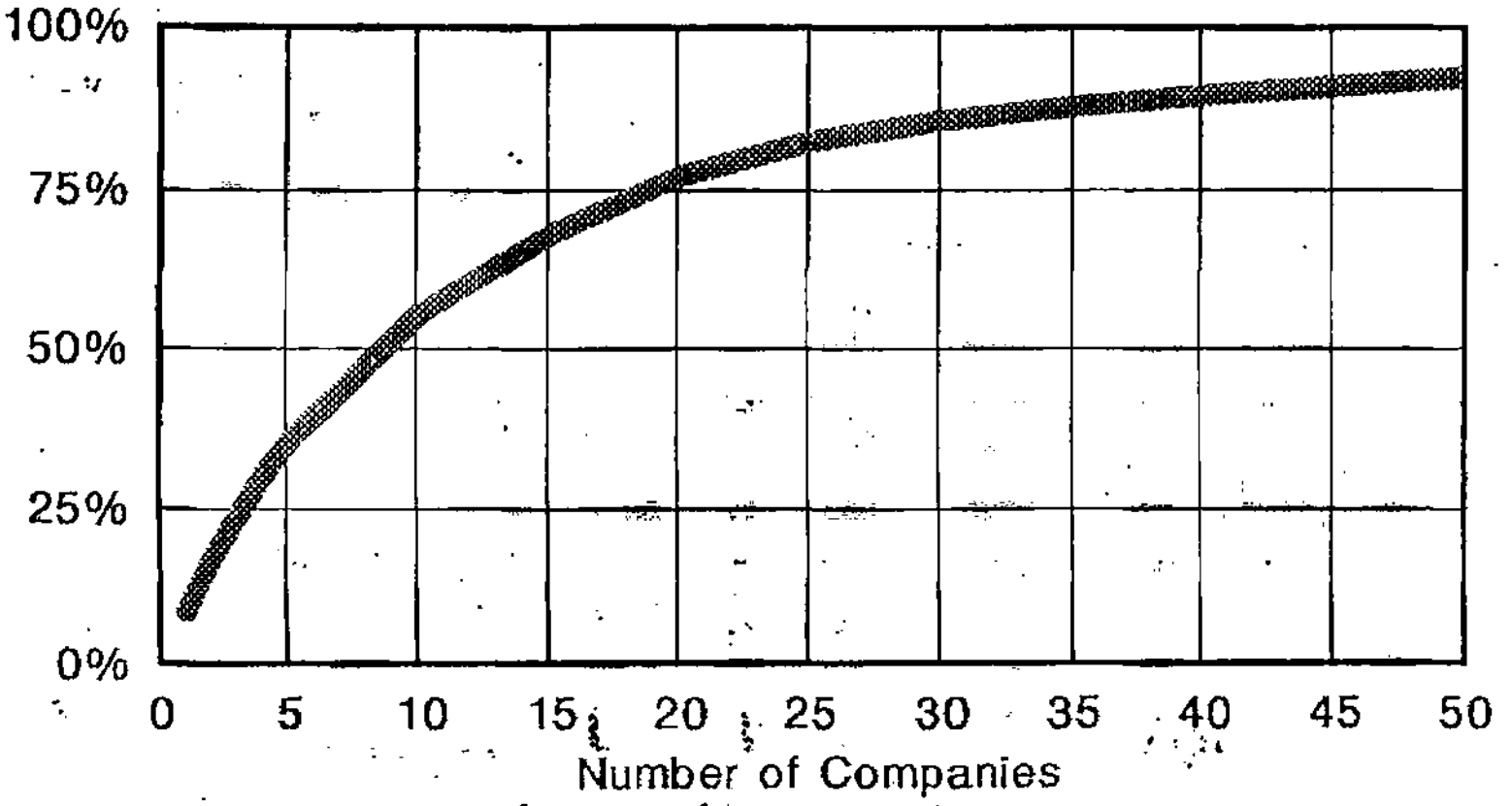
Source: Dataquest

TOP PRODUCERS' CUMULATIVE MARKET SHARE 1985



Source: Dataquest

TOP PRODUCERS' CUMULATIVE MARKET SHARE 1990



Source: Dataquest

STRATEGIC ALLIANCES: THE RIGHT PROGRAM AT THE RIGHT TIME

- Key technologies move on a broad front
- Rate of technical change still very fast
- High rate of capital consumption
- Concurrent rise in IPR protection

THE IMPORTANCE OF INTELLECTUAL PROPERTY RIGHTS (IPR) IN SC INDUSTRY DEVELOPMENT

- It is exclusionary, perhaps absolutely
- It is expensive to develop, and to buy
- It is distributed "unevenly":
  - IBM has a lot
  - Texas Instruments has a lot
  - Hitachi has a lot
  - Hughes and Brooktree have enough
  - Micron Technology doesn't have very much

One man can play: Gilbert Hyatt, Paul Richman, Jack Kilby

TEXAS INSTRUMENTS

(Millions of Dollars)

	1989	1990	1991
Component Revenue	$3,269	$3,159	$3,470
Royalties	$165	$172	$256
Operating Profit	$276	($76)	($188)

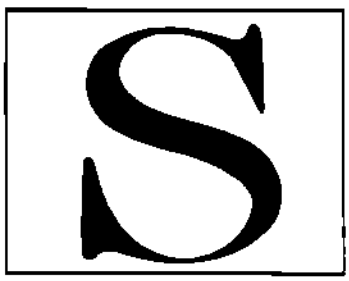
Source: Texas Instruments A.R.

MICRON TECHNOLOGY
COSTS OF TECHNOLOGY ACQUISITION

(Millions of Dollars)

	1989	1990	1991
Revenue	$446	$333	$425
R&D	$21	$36	$36
Royalties	$42	$34	$42
Royalty	9.4%	10.2%	9.9%

Source: Micron Tech. A.R. and 10K



Closing Remarks

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